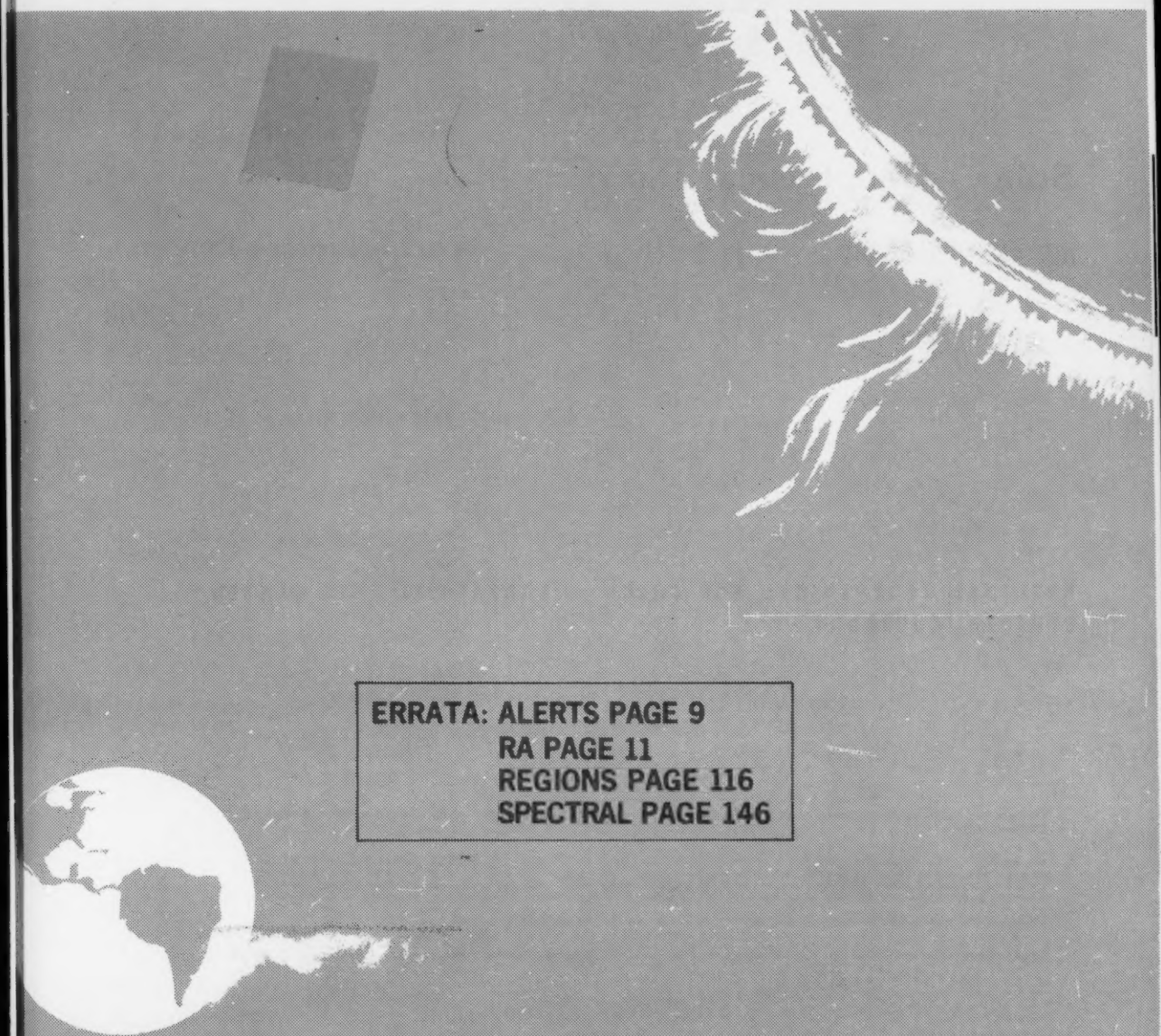
JANUARY 1979 Number 413 -- Part I

P-A STACKS

Solar-Geophysical Data prompt reports

Data for December 1978 -- November 1978

Explanation of Data Reports Issued as Number 402 (Supplement) February 1978



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Solar - Geophysical Data

NO. 413 JANUARY 1979

Part I (Prompt Reports)

DATA FOR
DECEMBER 1978
NOVEMBER 1978

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To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, 412 Part I (or Part II), pages, December 1978, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80303).

SOLAR-GEOPHYSICAL DATA

No. 413

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Chief
Solar-Terrestrial Physics Division

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A = Part I, B = Part II.

----- = no data available.
blank = data not yet received.

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DECEMBER 1978 DATA

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ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

DECEMBER 1978

PRESTO MESSAGES (THE RAPID REPORT OF MAJOR EVENTS).

11 DECEMBER 1978 BOULDER 11/2115Z SOFLARE X1/2B S16W48 11/1807Z DURATION 68 MINUTES.
TENFLARE 25000 FLUX UNITS 11/1918Z IN PROGRESS AT 11/2120Z.
SOFLARE X1/2B S17E14 11/1833Z DURATION 70 MINUTES.

12 DECEMBER 1978 BOULDER 12/1520Z SOFLARE X2/2B S16W58 12/1500Z DURATION 27 MINUTES.
TENFLARE 277 FLUX UNITS 15/1510Z DURATION 49 MINUTES.

18 DECEMBER 1978 BOULDER 18/0213Z SOFLARE M6/1B S15W51 17/0730Z DURATION 25 MINUTES.
TENFLARE 280 FLUX UNITS 17/0732Z DURATION 26 MINUTES.

27 DECEMBER 1978 BOULDER 27/1744Z SOFLARE X1/2B S17E43 27/1625Z DURATION 26 MINUTES.
TENFLARE 540 FLUX UNITS 27/1627Z DURATION 40 MINUTES.

30 DECEMBER 1978 BOULDER 30/1424Z SOFLARE M3/3B S12E63 30/0540Z DURATION 53 MINUTES TO HALF POWER, PARALLEL RIBBONS. WHITE LIGHT FLARE.

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
335	1	30	176	172	004	N13W82	1	0	0		1	N13W82	E	SOLALERT MAGALERT MINOR 01/02
						N15W40	0	0	0			N15W40	Q	
						S14W34	0	0	0			S14W34	Q	
						N09W15	0	0	0			N09W15	Q	
						N14E02	0	0	0			N14E02	Q	
						N15E11	2	0	0			N15E11	CA	
						N24E23	0	0	0			N24E23	Q	
						S18E40	7	0	0			S18E40	CA	
						S20E50	0	0	0			S20E50	E	
						N18E78	0	0	0			N18E78	Q	
336	2	1	170	171	009	N14W53	0	0	0		2	N14W53	Q	SOLALERT MAGNIL
						S27W38	0	0	0			S27W38	Q	
						N09W27	0	0	0			N09W27	Q	
						N13W06	0	0	0			N13W06	CE	
						N13W00	0	0	0			N13W00	CE	
						N24E09	0	0	0			N24E09	Q	
						S18E27	6	0	0			S18E27	CA	
						S19E36	0	0	0			S19E36	CA	
						N18E65	0	0	0			N18E65	Q	
						N23E67	0	0	0			N23E67	Q	
337	3	2	293	172	004	N18W68	0	0	0		3	N18W68	Q	SOLNIL MAGQUIET
						S26W48	3	0	0			S26W48	E	
						N09E42	0	0	0			N09E42	Q	
						N14W21	0	0	0			N14W21	Q	
						N13W12	0	0	0			N13W12	Q	
						S28W11	0	0	0			S28W11	Q	
						N24W04	0	0	0			N24W04	Q	
						S30W00	0	0	0			S30W00	Q	
						S18E14	5	0	0			S18E14	CA	
						S19E24	3	0	0			S19E24	CA	
						N28E37	0	0	0			N28E37	Q	
						S21E45	0	0	0			S21E45	Q	
						S34E52	0	0	0			S34E52	Q	
						N17E55	0	0	0			N17E55	Q	
						N23E55	0	0	0			N23E55	Q	
						S17E60	0	0	0			S17E60	Q	
						S24E72	0	0	0			S24E72	Q	
338	4	3	238	169	003	N18W82	0	0	0		4	N18W82	Q	SOLQUIET MAGQUIET
						N09W57	0	0	0			N09W57	Q	
						N13W25	0	0	0			N13W25	Q	
						N15W36	0	0	0			N15W36	Q	
						N23W16	0	0	0			N23W16	Q	
						S18W00	1	0	0			S18W00	E	
						S20E11	0	0	0			S20E11	E	
						N16E41	1	0	0			N16E41	Q	
						S26W64	0	0	0			S26W64	Q	
						N25E43	0	0	0			N25E43	Q	
						S30W14	0	0	0			S30W14	Q	
						S24E59	2	1	0			S24E59	E	
339	5	4	226	169	008	N13W38	0	0	0		5	N13W38	Q	SOLQUIET MAGQUIET
						N14W50	0	0	0			N14W50	Q	
						N24W28	0	0	0			N24W28	Q	
						S18W13	2	0	0			S18W13	A	
						S20W01	1	0	0			S20W01	E	
						N17E28	0	0	0			N17E28	Q	
						S26W77	0	0	0			S26W77	Q	
						N25E30	0	0	0			N25E30	Q	
						S30W27	1	0	0			S30W27	Q	
						S24E46	4	0	0			S24E46	E	
						S20E24	0	0	0			S20E24	Q	
340	6	5	225	174	006	N13W52	0	0	0		6	N13W52	Q	SOLQUIET MAGQUIET
						N14W63	0	0	0			N14W63	Q	
						N24W41	0	0	0			N24W41	Q	
						S18W25	5	0	0			S18W25	A	
						S21W14	0	0	0			S21W14	Q	
						N17E16	0	0	0			N17E16	Q	
						N25E18	0	0	0			N25E18	Q	
						S30W41	2	0	0			S30W41	E	
						S24E33	2	0	0			S24E33	E	
						S20E12	0	0	0			S20E12	Q	
341	7	6	246	169	004	N13W65	0	0	0		7	N13W65	Q	SOLQUIET MAGQUIET
						N14W76	0	0	0			N14W76	Q	
						N22W54	0	0	0			N22W54	Q	
						S18W39	2	0	0			S18W39	Q	
						S21W26	0	0	0			S21W26	Q	
						N16E02	0	0	0			N16E02	Q	
						N24E05	0	0	0			N24E05	Q	
						S30W51	4	0	0			S30W51	Q	
						S24E19	1	0	0			S24E19	Q	
						S20W01	0	0	0			S20W01	Q	
						S16E75	3	0	0			S16E75	Q	
						S15E40	0	0	0			S15E40	Q	
						N22E74	1	0	0			N22E74	Q	

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						Location Lat-Long	No. of Flares Total	M	X		Date	Location Lat-Long	Desc*	
342	8	7	223	186	002	N13W78	0	0	0		8	N13W78	Q	MAGQUIET SOLALERT 08/10
						N22W67	0	0	0			N22W67	Q	
						S18W54	1	1	0			S18W54	E	
						S21W43	0	0	0			S21W43	Q	
						N16W11	0	0	0			N16W11	Q	
						N25W08	0	0	0			N25W08	Q	
						S30W67	0	0	0			S30W67	E	
						S23E03	0	0	0			S23E03	Q	
						S19W15	0	0	0			S19W15	Q	
						S15E65	1	1	0			S15E65	A	
						S22E41	0	0	0			S22E41	Q	
						N22E63	0	0	0			N22S63	E	
						S17W01	0	0	0			S17W01	Q	
343	9	8	274	195	004	N23W81	0	0	0		9	N23W81	Q	SOLALERT 09/XX MAGQUIET
						S18W68	2	0	0			S18W68	CA	
						S21W56	0	0	0			S21W56	Q	
						N16W23	0	0	0			N16W23	Q	
						N26W21	0	0	0			N26W21	Q	
						S29W80	3	0	0			S29W80	DA	
						S23W10	2	0	0			S23W10	E	
						S18W27	0	0	0			S18W27	Q	
						S14E52	1	0	0			S14E52	A	
						S22E26	0	0	0			S22E26	Q	
						N22E48	0	0	0			N22E48	Q	
						S16W12	0	0	0			S16W12	Q	
						S12E61	0	0	0			S12E61	Q	
						N26E72	0	0	0			N26E72	Q	
344	10	9	286	206	004	S18W81	1	0	0		10	S18W81	Q	SOLALERT 10/XX MAGQUIET
						S20W71	0	0	0			S20W71	Q	
						N16W36	0	0	0			N16W36	Q	
						S23W23	0	0	0			S23W23	E	
						S18W41	0	0	0			S18W41	Q	
						S16E38	0	0	0			S16E38	A	
						S23E12	0	0	0			S23E12	Q	
						N21E33	4	0	0			N21E33	CA	
						S18W25	4	0	0			S18W25	Q	
						S12E45	0	0	0			S12E45	Q	
						N26E59	0	0	0			N26E59	Q	
						S19E04	0	0	0			S19E04	Q	
						N42E61	0	0	0			N42E61	Q	
345	11	10	217	211	001	S20W84	0	0	0		11	S20W84	Q	SOLALERT 11/XX MAGQUIET
						N17W49	0	0	0			N17W49	Q	
						S23W36	3	0	0			S23W36	E	
						S16E25	4	0	0			S16E25	A	
						N21E20	0	0	0			N21E20	A	
						S17W38	6	0	0			S17W38	A	
						S13E32	0	0	0			S13E32	E	
						N26E47	0	0	0			N26E47	Q	
						S18E12	1	0	0			S18E12	Q	
346	12	11	278	217	00	N17W62	0	0	0	SOFLARE X1/2B	12	N17W62	Q	SOLALERT 12/XX MAGALERT 12/13
						S23W49	0	0	0	S16W48 11/1807Z		S23W49	Q	
						S16E12	2	0	1	DURATION 68 MINUTES		S16E12	A	
						N22E07	3	0	0	SOFLARE X1/2B		N22E07	E	
						S17W51	5	2	0	S17E14 11/1033Z		S17W51	A	
						S12E17	0	0	0	DURATION 70 MINUTES		S12E17	Q	
						N26E33	0	0	0	TENFLARE 25000 FLUX		N26E33	Q	
						S17W00	0	0	0	UNITS 11/1918Z		S17W00	E	
						S17E22	0	0	0	IN PROGRESS AT		S17E22	Q	
						S23E72	0	0	0	2120Z		S23E72	Q	
						S11E41	0	0	0			S11E41	Q	
347	13	12	239	237	005	N18W77	0	0	0	SOFLARE X2/2B	13	N18W77	Q	PROTON FLARE ALERT 13/XX
						S24W64	2	0	0	S16W58 12/1500Z		S24W64	Q	MAGALERT 13/15
						S15W01	6	0	0	DURATION 27 MINUTES		S15W01	A	
						N22W06	4	0	0			N22W06	Q	
						S18W64	11	5	1	TENFLARE 277 FLUX		S18W64	P	
						S12E03	4	0	0	UNITS 15/1510Z		S12E03	E	
						N25E21	0	0	0	DURATION 49 MINUTES		N25E21	Q	
						S20W15	1	0	0			S20W15	Q	
						S17E09	0	0	0			S17E09	Q	
						S23E57	0	0	0			S23E57	Q	
						S12E28	0	0	0			S12E28	Q	
348	14	13	229	231	006	N17W88	0	0	0		14	N17W88	Q	PROTON FLARE ALERT 14/XX
						S24W77	0	0	0			S24W77	Q	MAGALERT 14/16
						S17W11	11	1	0			S17W11	A	
						N21W19	0	0	0			N21W19	Q	
						S17W79	20	4	1			S17W79	P	
						S12W11	2	0	0			S12W11	Q	
						N25E09	0	0	0			N25E09	Q	
						S20W28	1	0	0			S20W28	Q	
						S17E00	3	0	0			S17E00	E	
						S23E46	0	0	0			S23E46	Q	
						S12E16	0	0	0			S12E16	Q	

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						Location Lat-Long	No. of Flares Total	M	X		Date	Location Lat-Long	Desc*	
349	15	14	197	202	019	S23W90	0	0	0	KAKIOKA MAGSTORM	15	S23W90	Q	PROTON FLARE ALERT 15/XX
						S17W25	6	1	0	14/0129Z TOYOKAWA		S17W25	CP	MAJOR FLARE ALERT 15/XX
						N20W32	4	1	0	TENFLARE 160 FLUX		N20W32	DP	MAGALERT 15/17
						S12W25	0	0	0	UNITS DURATION 10		S12W25	Q	
						N26W05	0	0	0	MINUTES		N26W05	Q	
						S20W41	0	0	0	MAJOR FLARES X1/1B		S20W41	Q	
						S17W15	0	0	0	S17W79 14/0004Z		S17W15	Q	
						S22E33	1	0	0	DURATION 29 MINUTES		S22E33	Q	
						S12E02	0	0	0	X1/SN S15W80		S12E02	Q	
						S15W10	0	0	0	14/0722Z DURATION		S15W10	Q	
						N21E75	0	0	0	13 MINUTES		N21E75	Q	
350	16	15	227	199	023	S16W38	7	0	0	KAKIOKA MAGSTORM	16	S16W38	CA	MAJOR FLARE ALERT 16/18
						N21W46	7	0	0	15/0015Z		N21W46	E	PROTON FLARE ALERT 16/18
						S12W38	2	1	0			S12W38	CA	MAGALERT 16/17
						N26W16	0	0	0			N26W16	Q	
						S18W56	0	0	0			S18W56	E	
						S18W28	0	0	0			S18W28	CA	
						S23E21	0	0	0			S23E21	Q	
						S13W10	0	0	0			S13W10	Q	
						S16W23	0	0	0			S16W23	Q	
						N21E60	0	0	0			N21E60	Q	
						N12W16	0	0	0			N12W16	Q	
						S22E38	3	0	0			S22E38	Q	
						N10E76	0	0	0			N10E76	Q	
351	17	16	225	187	016	S15W50	3	0	0		17	S15W50	DP	PROTON ALERT NIL
						N21W59	2	0	0			N21W59	Q	SOLALERT 17/XX
						S19W68	0	0	0			S19W68	Q	MAGALERT 17/18
						S18W40	3	0	0			S18W40	CA	
						S23E08	0	0	0			S23E08	Q	
						S16W35	0	0	0			S16W35	Q	
						N20E50	0	0	0			N20E50	Q	
						S22E25	2	0	0			S22E25	Q	
						N11E67	0	0	0			N11E67	Q	
						N18W23	0	0	0			N18W23	Q	
						N19W08	4	0	0			N19W08	E	
352	18	17	221	184	007	S15W64	3	1	0	PRESTO BOULDER	18	S15W64	CA	SOLALERT 18/19 MAGALERT 18/XX
						N21W73	1	0	0	SOFLARE M8/1B		N21W73	E	
						S19W86	0	0	0	S15W51 17/0730Z		S19W86	Q	
						S18W53	1	0	0	DURATION 25 MINUTES		S18W53	E	
						S23W04	1	0	0	TENFLARE 280 FLUX		S23W04	Q	
						N20E35	0	0	0	UNITS 17/0732Z		N20E35	Q	
						S22E10	1	0	0	DURATION 26 MINUTES		S22E10	E	
						N12E54	0	0	0			N12E54	Q	
						N18W38	0	0	0			N18W38	Q	
						N20W21	1	0	0			N20W21	CA	
353	19	18	186	167	032	S15W81	2	0	0		19	S15W81	A	SOLALERT 19 MAGALERT 19
						N20W86	0	0	0			N20W86	Q	
						S18W67	2	1	0			S18W67	E	
						S24W17	0	0	0			S24W17	Q	
						N20E21	0	0	0			N20E21	Q	
						S22W01	0	0	0			S22W01	Q	
						N11E40	0	0	0			N11E40	Q	
						N18W52	0	0	0			N18W52	Q	
						N20W35	0	0	0			N20W35	E	
						S16E63	0	0	0			S16E63	Q	
354	20	19	152	159	025	S25W31	0	0	0		20	S25W31	Q	SOLNIL MAGALERT MINOR 20
						N21E10	0	0	0			N21E10	Q	
						S22W14	0	0	0			S22W14	Q	
						N11E26	1	0	0			N11E26	E	
						N18E66	0	0	0			N18E66	Q	
						N20W49	1	0	0			N20W49	E	
						N15E49	0	0	0			N15E49	Q	
						S22W00	0	0	0			S22W00	Q	
355	21	20	151	143	018	S26W43	0	0	0		21	S26W43	Q	SOLQUIET MAGNIL
						N20W02	0	0	0			N20W02	Q	
						S22W31	0	0	0			S22W31	Q	
						N11E13	2	0	0			N11E13	Q	
						N18W80	0	0	0			N18W80	Q	
						N20W62	3	0	0			N20W62	E	
						N15E34	0	0	0			N15E34	Q	
						N10E63	0	0	0			N10E63	Q	
						N22W46	0	0	0			N22W46	Q	
356	22	21	124	143	008	S27W55	2	0	0		22	S27W55	Q	SOLQUIET MAGQUIET
						N19W19	0	0	0			N19W19	Q	
						S23W45	1	0	0			S23W45	Q	
						N12E00	0	0	0			N12E00	Q	
						N19W74	5	0	0			N19W74	E	
						N12E49	2	0	0			N12E49	Q	
						N22W58	0	0	0			N22W58	Q	
						N24W22	0	0	0			N24W22	Q	
						S17E79	0	0	0			S17E79	Q	

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357	23	22	120	137	018	S26W68	0	0	0		23	S26W68	Q	SOLQUIET MAGQUIET
						N19W32	0	0	0			N19W32	Q	
						S23W59	1	0	0			S23W59	Q	
						N12W13	0	0	0			N12W13	Q	
						N20W87	0	0	0			N20W87	E	
						S22W42	0	0	0			S22W42	Q	
						N12E35	0	0	0			N12E35	Q	
						N26W36	2	0	0			N26W36	Q	
						S17E64	0	0	0			S17E64	Q	
358	24	23	132	138	009	S26W80	0	0	0		24	S26W80	Q	SOLQUIET MAGQUIET
						N21W45	0	0	0			N21W45	Q	
						S22W72	1	0	0			S22W72	Q	
						N12W25	0	0	0			N12W25	Q	
						N12E25	1	0	0			N12E25	E	
						N24W50	1	0	0			N24W50	E	
						S17E49	0	0	0			S17E49	Q	
						S28W71	0	0	0			S28W71	Q	
						N17W61	2	0	0			N17W61	E	
						N20E09	0	0	0			N20E09	Q	
						N27E65	0	0	0			N27E65	Q	
359	25	24	146	143	007	N18W59	0	0	0		25	N18W59	Q	SOLQUIET MAGQUIET
						N12W39	0	0	0			N12W39	DA	
						N13E12	0	0	0			N13E12	Q	
						N26W63	0	0	0			N26W63	Q	
						S28W83	0	0	0			S28W83	Q	
						N19E00	0	0	0			N19E00	Q	
						S24E16	0	0	0			S24E16	Q	
						N12E51	0	0	0			N12E51	Q	
						S29E70	0	0	0			S29E70	DE	
						S13E75	0	0	0			S13E75	Q	
360	26	25	150	143	023	S17E65	1	0	0	SYDNEY SSC 25/1212Z-	26	S17E65	DA	SOLQUIET MAGQUIET
						S29E58	1	0	0	FIELD DISTURBED		S29E58	Q	
						N11E38	1	0	0	1200-1500Z THEN		N11E38	E	
						S25E03	0	0	0	QUIET		S25E03	Q	
						N27E41	0	0	0			N27E41	Q	
						N19E14	0	0	0			N19E14	Q	
						N12W03	0	0	0			N12W03	Q	
						N12W52	0	0	0			N12W52	Q	
361	27	26	165	149	009	N12W66	0	0	0		27	N12W66	Q	SOLQUIET MAGQUIET
						N12W18	0	0	0			N12W18	Q	
						N19W27	0	0	0			N19W27	Q	
						S25W10	0	0	0			S25W10	Q	
						N11E24	0	0	0			N11E24	E	
						S30E47	0	0	0			S30E47	Q	
						S17E53	1	0	0			S17E53	E	
						S11W08	0	0	0			S11W08	Q	
						S19E61	0	0	0			S19E61	Q	
362	28	27	196	170	010	N12W81	0	0	0	PRESTO BOULDER	28	N12W81	Q	MAJOR FLARE ALERT MAGQUIET
						N12W32	0	0	0	27/1744Z		N12W32	Q	
						N20W40	0	0	0	SOFLARE X1/2B		N20W40	Q	
						N23E18	0	0	0	S17E43 27/1625Z		N23E18	Q	
						S24W23	0	0	0	DURATION 26 MINUTES		S24W23	Q	
						N11E12	0	0	0	TENFLARE 540 FLUX		N11E12	A	
						S30E36	1	0	0	UNITS 27/1627Z		S30E36	E	
						S14W40	3	0	1	DURATION 40 MINUTES		S14W40	A	
						S11W21	0	0	0			S11W21	Q	
						S19E46	1	0	0			S19E46	Q	
						S22W52	1	0	0			S22W52	Q	
363	29	28	223	174	011	N13W42	0	0	0		29	N13W42	Q	MAJOR FLARE ALERT 29/XX MAGQUIET
						N19W54	0	0	0			N19W54	Q	
						N21E05	0	0	0			N21E05	Q	
						N12W01	7	0	0			N12W01	A	
						S29E22	0	0	0			S29E22	E	
						S15E26	2	0	0			S15E26	DP	
						S11W34	0	0	0			S11W34	Q	
						S18E35	0	0	0			S18E35	Q	
						S22W67	0	0	0			S22W67	CE	
						S18E13	1	0	0			S18E13	Q	
						S22E40	0	0	0			S22E40	E	
						S33E47	2	0	0			S33E47	E	
						S35E73	1	0	0			S35E73	CA	
364	30	29	233	173	008	N19W67	0	0	0		30	N19W67	Q	SOLALERT 30/XX MAGQUIET
						N12W14	0	0	0			N12W14	CA	
						S29E10	0	0	0			S29E10	CE	
						S15E12	0	0	0			S15E12	DP	
						S19E21	0	0	0			S19E21	Q	
						S21W80	1	0	0			S21W80	Q	
						S19W00	0	0	0			S19W00	Q	
						S22E28	0	0	0			S22E28	Q	
						S32E32	0	0	0			S32E32	Q	
						S35E61	0	0	0			S35E61	A	
						S34W64	0	0	0			S34W64	Q	
						N15E64	0	0	0			N15E64	Q	
						S14E64	0	0	0			S14E64	Q	
						S22E70	0	0	0			S22E70	A	
						N12E80	0	0	0			N12E80	Q	

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365	31	30	229	190	015	N12W28	3	0	0	PRESTO BOULDER	31	N12W28	CA	SOLALERT 31/XX MAGQUIET
						S29W01	1	0	0	30/1424Z		S29W01	DA	
						S15W00	0	0	0	SOFLARE M3/3B		S15W00	CA	
						S19E08	0	0	0	S12E63 30/0540Z		S19E08	E	
						S19W13	0	0	0	DURATION 53 MINUTES		S19W13	E	
						S22E15	3	0	0	TO HALF POWER		S22E15	DA	
						S32E32	1	0	0	PARALLEL RIBBONS,		S32E32	Q	
						S35E52	0	0	0	WHITE LIGHT FLARE		S35E52	DP	
						N16E52	0	0	0			N16E52	Q	
						S13E53	3	1	0			S13E53	DA	
						S22E57	0	0	0			S22E57	Q	
						N13E68	1	0	0			N13E68	Q	
001	1	31	257	203	014	N12W42	0	0	0		1	N12W42	E	SOLNIL MAGQUIET
						S29W13	0	0	0			S29W13	Q	
						S15W13	0	0	0			S15W13	E	
						S18W05	0	0	0			S18W05	Q	
						S19W26	0	0	0			S19W26	Q	
						S22E02	2	0	0			S22E02	A	
						S33E07	1	0	0			S33E07	Q	
						S35E42	0	0	0			S35E42	E	
						N17E39	0	0	0			N17E39	Q	
						S12E41	1	0	0			S12E41	Q	
						S21E44	0	0	0			S21E44	Q	
						N13E54	3	0	0			N13E54	Q	
						N18W29	0	0	0			N18W29	Q	

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

ERRATA: An inconsistent error has appeared in the Alert Periods table in a number of SGD issues. The "Date of Forecasts" in these tables should be the same as the "Date of issue of the Geoalert WWA Messages", rather than the "Date of Observation". The following table lists the SGD issues where these dates were reversed. We thank Dr. T. Takiguchi, RWC Tokyo, Radio Research Laboratories, Technical Service Section, Japan, for kindly bringing this discrepancy to our attention.

Alert periods (December 1977 to November 1978) which should be corrected are as follows:

Date of Data	SGD Issue
December 1977	January 1978 SGD 401 Part I
January 1978	February 1978 SGD 402 Part I
February 1978	March 1978 SGD 403 Part I
March 1978	April 1978 SGD 404 Part I
May 1978	June 1978 SGD 406 Part I
June 1978	July 1978 SGD 407 Part I
July 1978	August 1978 SGD 408 Part I
August 1978	September 1978 SGD 409 Part I
September 1978	October 1978 SGD 410 Part I
October 1978	November 1978 SGD 411 Part I
November 1978	December 1978 SGD 412 Part I

RELATIVE SUNSPOT NUMBERS

ZURICH, R_z

1978 PROVISIONAL

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	84	128	93	70	77	119	46	42	127	90	109	110
2	88	120	83	68	85	93	61	48	167	119	122	110
3	102	131	96	71	91	74	47	38	151	107	125	117
4	102	138	103	75	76	60	34	62	161	91	129	106
5	73	137	76	94	74	51	54	74	175	55	116	104
6	69	129	67	92	73	29	57	66	178	71	103	122
7	42	121	90	88	70	39	84	58	148	95	110	132
8	36	89	99	105	56	45	105	62	120	103	118	142
9	36	94	85	126	59	36	108	64	109	121	108	152
10	15	96	92	111	57	29	115	67	105	149	116	138
11	18	95	85	109	63	57	127	58	84	158	122	170
12	26	92	78	107	65	62	111	71	72	158	99	188
13	26	93	65	93	72	56	114	85	88	156	90	165
14	36	82	62	75	72	62	109	93	113	170	78	150
15	30	59	72	61	78	89	102	72	133	166	59	140
16	23	64	78	85	91	97	110	42	148	163	77	138
17	24	56	66	99	79	103	98	49	136	137	92	139
18	14	55	72	100	85	115	78	53	158	123	88	120
19	8	53	64	107	84	109	74	42	150	154	85	90
20	7	52	51	115	74	109	76	28	163	151	76	70
21	20	63	77	112	73	154	77	26	172	144	62	58
22	30	74	82	109	73	158	48	36	148	125	77	50
23	43	69	85	105	72	158	33	45	156	116	53	57
24	37	78	82	102	82	154	38	45	167	103	57	68
25	32	94	70	139	86	135	30	54	163	96	85	79
26	47	86	53	115	84	152	13	37	152	91	101	93
27	69	79	50	90	97	134	21	55	140	115	118	110
28	79	88	49	75	90	130	31	58	122	117	118	122
29	90		48	72	103	115	48	59	122	137	109	135
30	104		44	70	107	99	35	70	91	129	96	148
31	118		70		109		36	100		98		167
MEAN	49.3	89.8	73.5	94.7	79.3	94.1	68.4	56.7	137.3	122.8	96.6	119.1

1977 yearly mean = 27.5

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

1978

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	126.9*	139.1	136.3	130.0	181.4	149.1	142.9	106.0	159.8	139.0	152.0	166.6
2	133.9	152.6	141.1	129.8	183.0	147.0*	127.6	106.0	171.7*	137.8	159.0	167.6
3	130.2	156.6*	146.6	134.5	182.2A	130.8	116.5	109.6	167.0	131.7	169.9	164.2
4	124.8	154.0	148.4	143.3*	178.4	118.6	117.4	112.3	174.4*	132.0*	177.4	165.3
5	119.2	159.0	154.5	146.7*	173.9*	116.9	118.9	117.6	179.4	138.7*	181.2	169.5
6	118.7*	156.1	162.8	145.3*	173.1	109.8	119.3*	122.6	181.1	137.4	172.2*	164.5
7	111.6	157.3	165.2	146.9	162.6*	110.6	128.9	128.2	177.5	141.6	174.6	178.5*
8	102.8	157.0*	168.7	148.6	143.4	109.3	135.9	130.6	167.1	150.1	168.0*	189.9
9	97.0	155.2	183.7	156.1	135.1	106.5	147.1*	128.1*	157.6*	155.8	164.9*	189.6
10	93.5	148.7	179.1	155.4	129.5	108.4	156.0*	127.5	149.8	162.3	166.3	204.7
11	93.1	154.2	175.2	162.8*	133.8	113.2	163.2*	121.7	141.5	171.6*	163.7	210.5
12	92.1	159.0	169.8	156.2	138.2	116.4*	174.2*	124.5	138.5	177.2	150.4	217.3
13	90.3	151.2	160.9	145.6	140.2	120.3*	165.5	134.9	138.0	178.5	145.3	210.6*
14	88.6	148.4	160.5	139.1	143.7	126.4*	163.1	132.7	143.5*	180.1	136.3	197.0
15	89.6	136.8	154.2	141.4	146.1	132.5	169.5	130.0*	152.6	182.0	133.8	192.7
16	86.4	138.2	143.3	137.6	147.8*	139.5*	163.4	123.6	161.5	176.7*	128.8	180.5
17	83.8	125.9	135.4	133.4	143.8	149.0	159.5	119.3*	161.8	171.5	128.1	177.7
18	84.7	124.9	132.3	134.1	135.6	153.5*	154.1*	115.6	169.3*	169.4	127.4	161.5
19	85.4	119.1	128.1	139.5*	133.6	162.0*	148.6	111.6	168.8*	170.4	128.9	152.9
20	87.0	122.2	125.3	138.1	132.3*	174.2	142.9*	107.5	168.6	171.0	134.9	138.1
21	91.4	122.2	118.2	138.4*	132.7	185.4*	140.2	104.8	172.5	166.9*	126.0	132.1*
22	96.9	127.7	117.0	146.4	135.7*	190.3	127.0	106.0	171.5*	161.4	127.1	132.7
23	99.6	131.8	116.4	162.9	142.9*	196.7	123.4*	104.1	165.5*	161.4	121.9	133.4
24	108.4	135.6	117.5	159.8	146.5*	194.8	118.5	105.4	158.9	156.9	123.5	135.2*
25	103.3	139.3	118.2	159.1*	147.6	183.5	113.7	104.2	157.2	156.1	124.7*	138.0
26	112.7	134.8	112.5	166.7	152.8	182.4*	112.2	100.7	148.5	154.4	132.7	144.2
27	116.4	137.5	114.1	172.8	150.6*	179.5	110.8	107.3*	146.2*	150.7	144.4*	148.7*
28	127.7*	135.4	112.7	176.6*	147.1*	174.1	109.9	107.7*	147.8	148.4*	154.1	164.1
29	132.2*		111.1	185.2	148.6	167.4	109.2	116.2	148.1	149.8	162.2	166.2
30	134.9		115.4*	182.1*	147.2*	154.6*	109.2	124.1	142.6	146.5	167.8	181.7
31	133.3*		124.5		152.6		108.8	133.9*		144.8		195.1
MEAN	106.1	141.8	140.3	150.5	149.7	146.8	135.4	116.9	159.6	157.1	148.2	170.0

* adjusted for burst
A = interpolated data point

DAILY SOLAR INDICES

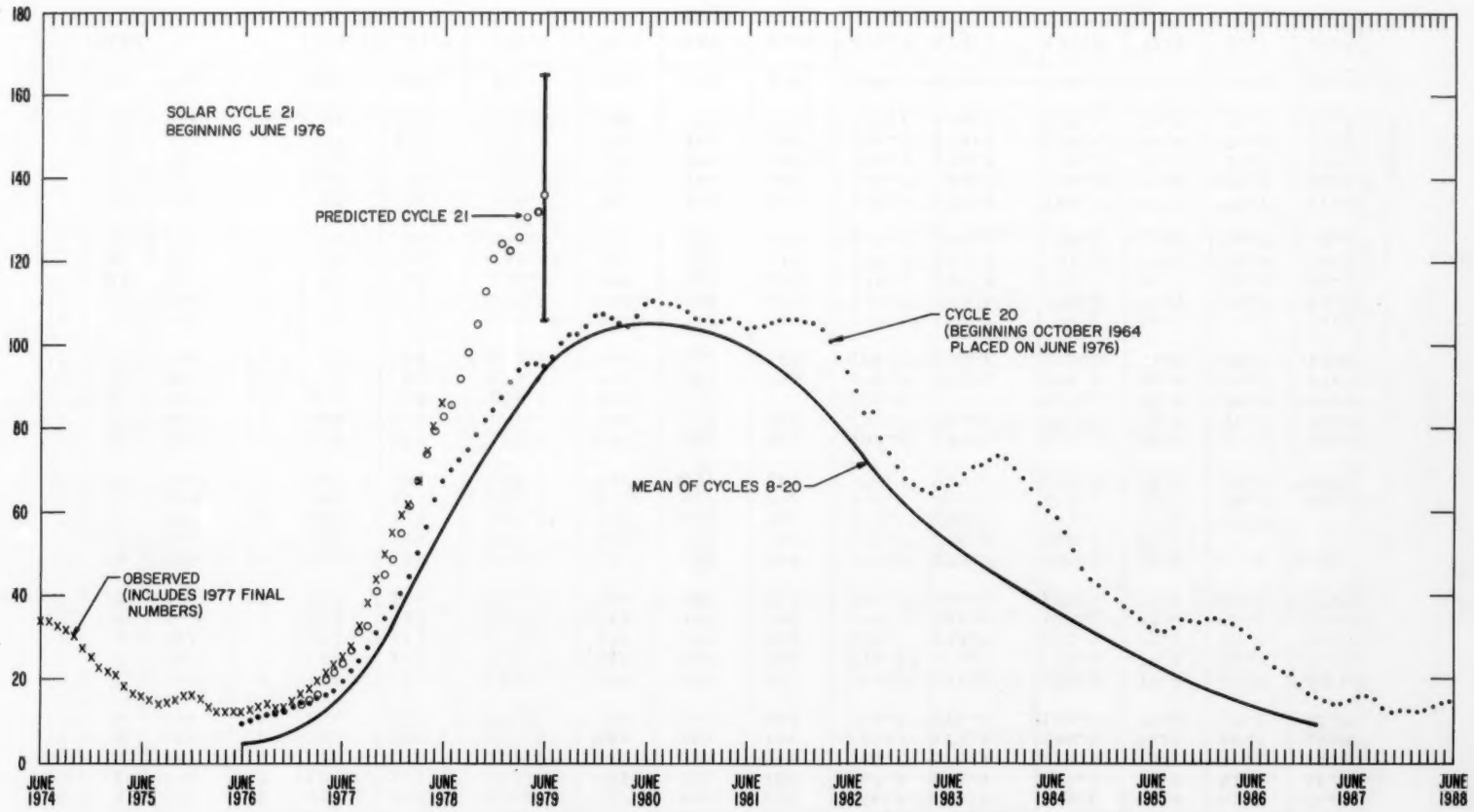
DECEMBER 1978

DEC 1978	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	335	1	110	100	171.4	582	353	197	166.6	175.0	120.6	74.5	41.3	15.4
2	336	2	110	101	172.4	590	351	200	167.6	178.9	129.0	79.2	41.4	14.2
3	337	3	117	132	169.1	583	354	196	164.2	176.1	125.6	78.4	44.1	15.9
4	338	4	108	125	170.2	588	351	191	165.3	173.6	124.5	77.8	45.7	19.0
5	339	5	104	100	174.6	594	348	200	169.5	174.9	122.6	75.6	37.3	13.3
6	340	6	122	127	169.4	587	352	211	164.5	181.8	122.5	75.8	35.9	13.4
7	341	7	132	137	184.0*	588	363	216	178.5*	188.7	122.4	74.1	34.2	13.9
8	342	8	142	149	195.8	590	375	233	189.9	193.7	131.5	78.7	35.5	14.4
9	343	9	152	152	195.5	592	387	250	189.6	201.1	122.3	73.4	41.4	15.4
10	344	10	138	144	211.0	594	398	267	204.7	208.5	139.4	77.6	46.8	33.5
11	345	11	170	159	217.2	607	426	288	210.5	222.7	142.5	81.2		
12	346	12	188	174	224.3	613	432	293	217.3	228.0	145.3	82.7		
13	347	13	165	174	217.3*	605	419	267	210.6*	222.9	142.1	79.2	47.8	
14	348	14	150	130	203.3	610	418	246	197.0	210.8	132.1	72.7	36.8	19.4
15	349	15	140	130	198.9	602	397	241	192.7	205.1	130.6	74.6	40.3	22.0
16	350	16	138	149	186.5	597	386	219	180.5	189.6	115.3	69.1	34.3	18.2
17	351	17	139	155	183.6	588	378	218	177.7	183.8	116.9	71.8	37.5	19.3
18	352	18	120	115	166.8	598			161.5		112.6	73.0	39.5	24.8
19	353	19	90	84	158.0	588	357	192	152.9	164.1	105.4	69.4	41.5	17.6
20	354	20	70	78	142.7	580	341	176	138.1	139.7	101.0	74.0	47.0	17.2
21	355	21	58	72	136.5*	577	340	180	132.1*	144.7	96.1	66.7	37.9	24.6
22	356	22	50	72	137.1	586	344	173	132.7	137.8	92.0	67.9	35.3	22.0
23	357	23	57	68	138.0	577	333	170	133.4	137.0	95.5	64.8	46.6	20.1
24	358	24	68	61	139.8*	581	338	176	135.2*	143.2	98.2	69.8	40.4	14.1
25	359	25	79	86	142.7	582	335	176	138.0	143.6	98.5	67.8	30.9	9.3
26	360	26	93	88	149.1	583	331	173	144.2	152.8	105.7	67.0	35.7	11.4
27	361	27	110	92	153.8*	583	354	185	148.7*	163.3	114.8	73.2	39.0	12.4
28	362	1	122	87	169.7	595	355	197	164.1	168.3	121.3	76.1	39.5	12.5
29	363	2	135	139	171.9	591	357	196	166.2	170.8	119.4	74.4	39.8	12.2
30	364	3	148	180	187.9	596	373	222	181.7	186.9	128.1	76.7	39.2	11.9
31	365	4	167	190	201.8	601	379	234	195.1	202.9	133.0	80.0	38.1	14.4
MEAN			119.1	121.0	175.5	591	367	213	170.0	179.0	119.6	74.1	39.7	16.9

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill are due to equipment problems.

ERRATA: The September 1978 $R_{A'}$ monthly mean value was published as "12.8". This value should read "128.1". These data appear in SGD 410 Part I, page 11, October 1978 issue.



OBSERVED AND PREDICTED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	14.0	14.3	13.4	13.5	14.8
1977	16.7	18.1	20.0	22.2	24.2	26.3	28.8	33.0	38.5	44.6	50.5	55.4
1978	59.6	62.7	67.7	74.9	81.0	87.0	92.0	96.6	100.8	104.4	108.6	114.4
							(3)	(6)	(9)	(11)	(11)	(11)
1979	119.1	123.3	127.3	129.9	132.3	136.4	140.4	143.2	145.1	146.2	146.6*	146.2
	(12)	(14)	(18)	(23)	(27)	(30)	(32)	(34)	(36)	(37)	(38)	(39)
1980	145.0	143.8	143.3	143.9	143.4	140.6	137.4	134.8	133.4	132.5	131.1	129.8
	(39)	(39)	(37)	(37)	(38)	(39)	(41)	(42)	(42)	(43)	(45)	(48)
1981	129.5	128.9	126.6	123.8	121.4	119.1	117.9	117.6	116.7	115.3	113.0	110.1
	(50)	(50)	(48)	(47)	(47)	(47)	(46)	(44)	(44)	(44)	(43)	(41)
1982	107.3	104.3	101.9	99.9	97.8	95.4	91.8	87.6	83.8	79.5	76.4	72.9
	(38)	(37)	(36)	(34)	(32)	(31)	(29)	(27)	(25)	(22)	(20)	(20)
1983	68.8	65.9	63.9	61.7	59.5	57.2	55.2	53.4	51.7	50.5	49.6	48.9
	(20)	(21)	(21)	(22)	(22)	(23)	(24)	(25)	(27)	(29)	(30)	(30)
1984	47.8	46.0	43.5	40.4	37.9	36.8	35.8	34.2	32.7	31.6	30.4	28.8
	(31)	(30)	(28)	(28)	(29)	(31)	(31)	(31)	(30)	(29)	(27)	(27)
1985	27.7	26.8	25.9	25.4	24.7	23.7	23.0	22.2	21.5	20.6	19.7	19.1
	(27)	(26)	(26)	(26)	(25)	(24)	(23)	(22)	(22)	(23)	(23)	(24)
1986	18.7	18.0	17.3	16.3	15.2	14.0	13.1	12.4	12.2	12.0	11.8	11.7
	(24)	(24)	(23)	(22)	(21)	(20)	(19)	(18)	(17)	(16)	(15)	(13)
1987	12.0	12.6	13.4	14.4	15.4	16.4	17.4					
	(12)	(11)	(11)	(11)	(12)	(13)	(13)					

The table gives observed Zürich smoothed sunspot numbers for Cycle 21 up to the one calculated from the latest observed data, marked by a vertical bar. They are based on final Zürich numbers through 1977 and provisional Zürich numbers thereafter. Some of these data after the June 1976 value will change slightly when final data for 1978 are received. The numbers after the vertical bar are predictions by the McNish-Lincoln method (see *Explanation of Data Reports*, February 1978). Shown in parentheses are the corresponding absolute values of the 90% confidence interval, an indication of the uncertainty above and below the predicted number.

The McNish-Lincoln method is very sensitive to the identification of a minimum epoch. In SGD 390-401 issues, the Cycle 21 predictions were based on March 1976 as the minimum epoch. Latest studies, including one published by Waldmeier, show that June 1976 is the more appropriate epoch of minimum. Thus, we have adopted a June 1976 mimimum.

*Prediction of Sunspot Maximum -- The McNish-Lincoln prediction method is recommended for predictions up to only one year ahead. From that point, the predictions regress rapidly towards the mean value. Combining this McNish-Lincoln prediction of sunspot maximum with the Ohl method (as done by Sargent, see *Explanation of Data Reports*, February 1978) indicates that the most probable value for sunspot maximum is 150 ± 34.

Hα SOLAR FLARES

DECEMBER 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
RAMY	01	1214E	1214	1259	S17	E31	.533		3.8	45D	SN	2	C		19		
RAMY	01	1450E	1458U	1507	S17	E30	.520		3.9	17D	SB	3	C		80		
HOLL	01	1955	1956	2005	S16	E31	.530		4.2	10	SB	3	C		58		
RAMY	01	1955	1955	2017	S17	E34	.574		4.4	22	SB	3	C		133		FDE
PALE	01	2205	2233	2256	S17	E27	.479		3.9	51	SB	3	C		118		DE F
PALE	01	2344	2346	0013D	S17	E27	.479		4.0	29D	SB	3	C		31		DE F
MANI	02	0405E	0407U	0422D	S17	E30	.519		4.4	17D	SN	3	V		50	.6	
MANI	02	0438E	0438U	0455	S15	E24	.426		4.0	17D	SN	3	V		100	1.2	F
MANI	02	0549	0549U	0615D	S15	E25	.440		4.1	26D	SN	3	V		120	1.4	F
TEHR	02	0735	0739	0743D	S18	E29	.510		4.5	8D	SB	1	C		127		FDE
RAMY	02	1403	1404	1414	S26	W46	.745		30.1	11	SN	2	C		34		
RAMY	02	1520	1525	1527	S20	E31	.547		5.0	7	SN	2	C		69		
RAMY	02	1523	1524	1534	S26	W47	.755		30.1	11	SN	2	C		16		
RAMY	02	1713	1714	1720	S26	W48	.765		30.1	7	SN	2	C		34		
RAMY	02	1843	1844	1853	S17	E22	.409		4.4	10	SN	3	C		42		F
RAMY	02	1911	1917	1924	S17	E22	.409		4.4	13	SB	3	C		36		
RAMY	03	1542	1546	1550	S18	E 4	.216		4.0	8	SN	3	C		29		
PALE	03	1839E	1839U	1845	S23	E64	.896		8.6	6D	SN	3	C		15		
HOLL	03	1839	1839	1844	S23	E66	.910		8.7	5	SN	3	C		19		
RAMY	03	1839	1840	1846	S23	E65	.903		8.7	7	SB	3	C		19		
RAMY	03	1938	1939	1952	N17	E44	.758		7.1	14	SN	3	C		35		F
PALE	03	2032	2033U	2042	S22	E65	.903		8.7	10	SB	3	C		40		DE
HOLL	03	2036E	2036U	2044	S23	E65	.903		8.7	8D	SB	1	C		37		
RAMY	03	2037E	2037U	2045D	S25	E64	.898		8.7	8D	SB	3	C		69		
RAMY	04	1320	1324	1325D	S23	E53	.805		8.5	5D	SB	3	V		19		
RAMY	04	1453E	1509	1550	S18	W 8	.244	15687	4.0	57D	1B	3	C		465		U F
RAMY	04	1522	1523	1531	S20	E 5	.252		5.0	9	SB	3	C		63		F
MCMA	04	1529E		1532D	S18	W08	.244	15687	4.0	3D	SN		P	1529	150	1.6	E
RAMY	04	1550	1552	1605	S23	E50	.776		8.4	15	SB	3	C		84		F
MCMA	04	1558E		1604D	S25	E58	.852	15694	9.0	6D	SN		P	1558	35	.8	DH
RAMY	04	1716	1729	1738	S18	W10	.264		4.0	22	SN	3	C		27		
RAMY	04	1819	1819	1829	S30	W23	.532		3.0	10	SN	3	C		29		
RAMY	04	1844	1846	1857	S23	E47	.746		8.3	13	SB	3	C		91		H
MCMA	04	1852E		1855D	S25	E56	.835	15694	9.0	3D	1B		P	1853	100	2.1	EH
MANI	05	0742E	0746U	0810D	S18	W16	.334		4.1	28D	SN	3	P		60	.6	F
RAMY	05	1228	1236	1245	S18	W20	.387		4.0	17	SB	3	C		24		F
RAMY	05	1426	1427	1433	S18	W21	.400		4.0	7	SN	3	C		42		F
RAMY	05	1426	1428	1430	S23	E38	.645		8.5	4	SN	3	C		23		
RAMY	05	1637	1637	1641	S30	W35	.650		3.1	4	SN	3	C		17		
HOLL	05	1839	1847	2003	S18	W23	.427	15687	4.1	84	1B	2	C		207		U
RAMY	05	1843E	1847	1903	S18	W24	.441		4.0	20D	SB	3	C		104		DE
RAMY	05	1940	1942	2013	S30	W36	.660		3.1	33	SN	3	C		30		F
HOLL	05	2315	2320	0000	S18	W25	.455		4.1	45	SB	1	C		103		
RAMY	06	1347	1348	1354	S30	W46	.757		3.1	7	SN	3	C		64		
RAMY	06	1545	1546	1555	S30	W47	.766		3.1	10	SN	3	C		36		
MCMA	06	1846E	1857	1900D	S17	W38	.624	15687	3.9	14D	SN		C	1857	70	1.0	E
MCMA	06	1847	1850	1900D	S24	E24	.485	15694	8.6	13D	SB		C	1850	50	.6	E
RAMY	06	1854	1854	1911	S18	W37	.614		4.0	17	SB	3	C		74		F
MCMA	06	1935		1948D	N21	E85	.999	15700	13.2	13D	SN		P	1938			E
MCMA	06	1938E		1948D	S17	W38	.624	15687	4.0	10D	SN		P	1940	100	1.4	EH
RAMY	06	1942	1943	2002	S18	W37	.614	15687	4.0	20	1B	2	C		213		U F
RAMY	06	1949	1950	1955	S30	W49	.785		3.2	6	SN	2	C		44		
RAMY	06	2002	2008	2025	S30	W49	.785		3.2	23	SN	2	C		27		
PALE	06	2024E	2030U	2135D	N21	E76	.983		12.6	71D	SN	3	C		41		DE
PALE	06	2100	2112	2136D	S16	E79	.977		12.8	36D	SN	3	C		56		DE
PALE	06	2340	2342	2358	S14	E77	.970		12.8	18	SB	3	C		28		FDE
MANI	06	2355E	2355U	0001D	S14	E78	.974		12.8	6D	SF	2	V		20	.5	F
PALE	07	2354E	2357	0013D	S16	W52	.785		4.1	19D	SB	2	C		26		FDE
PALE	08	1809	1826	1841	S23	W 7	.307		8.2	32	SN	3	C		30		DE
PALE	08	1902	1905	1910	S30	W77	.968		3.0	8	SB	3	C		22		DE
HOLL	08	1903	1905	1909	S30	W77	.968		3.0	6	SN	3	C		19		F
HOLL	08	1952	1954	2000	S30	W77	.968		3.1	8	SB	3	C		40		
HOLL	08	2006	2007	2011	S15	E54	.805		12.9	5	SN	3	C		18		F
HOLL	08	2043	2043	2106	S22	W 7	.291		8.3	23	SB	3	C		30		F

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COND.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
PALE	09	0024	0025	0027	S18	W70	.934		3.8	3	SN	3	C		42		
PALE	09	0031E	0036	0043	S17	W12	.271		8.1	12D	SN	3	C		26		
PALE	09	0112E	0113	0117	N24	E42	.778		12.2	5D	SB	3	C		100		U
MONT	09	1104E	1104	1119D	S14	E44	.693		12.8	15D	SN		C	1104	150		
RAMY	09	1834	1835	1918	N21	E36	.705		12.5	44	SF	3	C		24		F
RAMY	09	1933	1937	2026	N21	E36	.705		12.5	53	SN	3	C		26		F
RAMY	09	1934	1935	1947	S19	W21	.406		8.2	13	SF	3	C		23		
RAMY	09	2000	2006	2023	S19	W21	.406		8.3	23	SF	3	C		43		F
RAMY	09	2050	2051	2112	N21	E35	.695		12.5	22	SB	3	C		46		F
HOLL	09	2050	2051	2103	N22	E35	.702		12.5	13	SB	2	C		29		F
HOLL	09	2146	2146	2151	S16	W25	.442		8.0	5	SN	2	C		19		F
PALE	10	0206	0207	0208D	S31	W90	.998		3.3	2D	SN	2	C		0		
MANI	10	0207E	0207U	0215D	S30	W90	.998		3.3	8D	SN	3	C		0		
RAMY	10	1233E	1234	1238D	S18	W32	.548		8.1	5D	SB	2	C		44		F
HOLL	10	1634	1634	1641	S16	W34	.568		8.1	7	SN	2	C		25		F
MCMA	10	1658	1659	1710	N21	E28	.629	15700	12.8	12	SN		C	1659	80	1.0	E
MCMA	10	1810E		1823D	S14	E32	.535	15697	13.2	13D	SN		P	1820	125	1.6	EH
HOLL	10	1817	1820	1828	S16½	E28	.485		12.9	11	SB	2	C		127		U F
HOLL	10	1827	1827	1831	S18	W53	.797		6.8	4	SN	2	C		62		F
HOLL	10	1832	1919	1932	S16	W35	.581		8.1	60	SB	2	C		102		U
RAMY	10	1834	1836	1852	S23	W32	.572		8.4	18	SN	2	C		61		
HOLL	10	1844	1846	1848	S18	W53	.797		6.8	4	SN	2	C		32		F
RAMY	10	1926	1926	1935	S23	W33	.584		8.3	9	SN	2	C		19		F
HOLL	10	1933	1947	1958	S16	W36	.594		8.1	25	SB	3	C		120		F
HOLL	10	1939	1942	1946	S16	E27	.470		12.8	7	SB	3	C		75		F
RAMY	10	1940	1940	1953	S15	E27	.466		12.8	13	SN	2	C		65		F
RAMY	10	1950	2001	2034	S23	W33	.584		8.4	44	SB	2	C		26		
HOLL	10	1958	2002	2042	S16	W36	.594		8.1	44	SB	3	C		114		Z F
RAMY	10	2001	2001	2031	S15	E27	.466		12.9	30	SN	2	C		68		
PALE	10	2010E		2013D	S18	W36	.600		8.1	3D	SN	2	C		65		DE
RAMY	10	2028	2028	2045	S18	W41	.663		7.8	17	SN	2	C		107		F
HOLL	10	2233	2237	2300	S18	E14	.306		12.0	27	SB	2	C		103		F
PALE	10	2338E	2339	2342D	S13	E33	.546		13.5	4D	SN	2	C		47		FDE
MONT	11	0926E	0926	0934	S17	W42	.673		8.2	8D	SN		C	0926	70		
MONT	11	1003	1007	1035	S17	W42	.673		8.3	32	SN		C	1007	70		E
MONT	11	1055	1057	1125	S14	E19	.343		12.9	30	SN		C	1057	180		E
RAMY	11	1532	1533	1537D	S18	W48	.744		8.0	5D	SN	2	C		18		
RAMY	11	1750	1814	1832	S19	W51	.778		7.9	42	SB	3	C		141		DE
RAMY	11	1806	1810	1823	N21	E11	.495		12.6	17	SB	3	C		95		F
HOLL	11	1807E	1814	1926D	S16	W48	.742	15694	8.2	79D	1N	3	C		162		Z U
HOLL	11	1807E	1925	1926D	S16	W48	.742	15694	8.2	79D	2B	3	C		888		Z U
HOLL	11	1812	1813	1824	N21	E11	.495		12.6	12	SN	3	C		59		F
HOLL	11	1833	1942	2018	S17	E14	.295	15697	12.8	105	2B	3	C		859		Z U
RAMY	11	1833	1947	2100	S19	W52	.788	15694	7.9	147	1B	3	C		305		DE
RAMY	11	1934	1942	1957D	S15	E14	.277	15696	12.9	23D	1B	2	C		317		DE
HOLL	11	2221	2222	2253	N21	E 6	.481		12.5	32	SN	3	C		26		F
HOLL	11	2221	2222	2226	S17	E12	.270		12.8	5	SB	3	C		24		
MANI	12	0435E	0435U	0443	S13	E16	.292		13.4	8D	SN	3	C		30		
MANI	12	0523E	0525	0536	S16	W55	.815		8.1	13D	SN	3	C		30		F
MANI	12	0645	0646	0655	S17	W54	.806		8.2	10	SN	3	C		40		
MANI	12	0646	0650	0654	S14	E 6	.163		12.7	8	SN	3	C		20		
MANI	12	0753E	0755	0804D	S16	W57	.834		8.1	11D	SB	3	C		50		
WEND	12	1002		1152	S17	W56	.825	15694	8.2	110	2N		V		600	11.6	E
RAMY	12	1133	1133	1140	S15	E 6	.177		12.9	7	SN	2	C		46		
RAMY	12	1139E	1159	1312	S19	W71	.939		7.2	93D	SB	2	C		71		F
RAMY	12	1211	1211	1234	S15	E 5	.168		12.9	23	SB	3	C		44		F
RAMY	12	1231	1233	1305	N21	E 0	.465		12.5	34	SB	3	C		48		F
RAMY	12	1328	1332	1401	S24	W55	.823		8.4	33	SB	3	C		101		F
RAMY	12	1402	1403	1406	N21	W 0	.465		12.6	4	SB	3	C		78		
RAMY	12	1414	1418	1440	S24	W55	.823		8.5	26	SB	3	C		102		F
RAMY	12	1414	1418	1425	S19	W72	.945		7.2	11	SB	3	C		31		
RAMY	12	1503	1514	1636	S19	W73	.950	15689	7.2	93	2B	3	C		423		
HOLL	12	1509	1514	1634D	S16	W59	.852	15694	8.2	85D	2B	3	C		508		Z U
HOLL	12	1515	1618	1634D	S19	W11	.281	15696	11.8	79D	1B	3	C		393		FDE
MCMA	12	1521E		1521D	S18	W59	.853	15694	8.2		1B		P	1521	150	3.2	E
RAMY	12	1617	1620	1638	S11	E 9	.172		13.4	21	SB	3	C		33		
RAMY	12	1637	1641	1654	S19	W73	.950		7.2	17	SB	3	C		24		
RAMY	12	1652	1708	1721	S15	E 2	.149		12.9	29	SB	3	C		42		

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
RAMY	12	1653	1654	1729	S11	E 8	.157		13.3	36	SN	3	C		54		
RAMY	12	1655	1702	1718	S19	W73	.950		7.2	23	SB	3	C		49		
RAMY	12	1726	1836	1840D	S19	W74	.955	15689	7.2	74D	1B	4	C		98		
RAMY	12	1730	1730	1735	S11	E 8	.157		13.3	5	SN	3	C		21		
RAMY	12	1731	1731	1742	S15	E 2	.149		12.9	11	SB	4	C		22		
RAMY	12	1753	1754	1801	N21	W 2	.466		12.6	8	SB	4	C		85		
PALE	12	1836E	1836U	1900D	S17	W64	.893	15694	8.0	24D	2B	3	C		315		
PALE	12	1836E	1836U	1840D	S20	W77	.968	15689	7.0	4D	2B	2	V		237		
RAMY	12	1841	1844	1859	S17	E14	.295		13.8	18	SN	4	C		41		
PALE	12	1841E	1841U	1900D	N21	W 4	.469		12.5	19D	SB	3	C		80		
RAMY	12	1850	1856	1908	N21	W 3	.467		12.6	18	SB	4	C		70		
PALE	12	1926E	2018	2032D	S18	W65	.900		7.9	66D	SN	3	C		104		DE
RAMY	12	2008	2012	2029	S11	E 7	.142		13.4	21	SB	3	C		105		
RAMY	12	2012	2012	2023	S15	E 1	.146		12.9	11	SB	3	C		60		
PALE	12	2053E	2053U	2056	S18	W65	.900	15694	8.0	3D	1B	3	C		256		DE
PALE	12	2056E	2136U	2300D	S19	W67	.914	15694	7.8	124D	1B	3	C		132		DE
PALE	12	2136E	2136U	2149D	S20	W10	.284		12.2	13D	SB	3	C		105		
PALE	12	2301	2307	2357D	S18	W66	.907	15694	8.0	56D	1B	3	C		270		UDE
MANI	13	0014E	0014U	0055	S17	W68	.921		7.9	41D	SB	3	C		40		
PALE	13	0017E	0018U	0103D	S18	W67	.914	15694	8.0	46D	1B	3	C		161		DE F
MANI	13	0210E	0210U	0224D	S15	W 4	.159		12.8	14D	SN	3	C		20		
MANI	13	0210E	0211	0224D	S16	W69	.927		7.9	14D	SB	3	C		60		
TEHR	13	0429E	0431U	0447	S16	W76	.965		7.5	18D	SB	2	C		95		
TEHR	13	0429E	0431U	0436D	S11	W 5	.114	15697	12.8	7D	1B	2	C		222		
TEHR	13	0429E	0431U	0527	S11	W 5	.114	15687	12.8	58D	1B	2	C		222		F
MANI	13	0435E	0435U	0443	S13	E16	.292		14.4	8D	SN	3	C		30		
TEHR	13	0513	0623U	0731	S16	W73	.950	15697	7.7	138	1B	2	C		159		F
TEHR	13	0513	0520U	0731	S16	W73	.950		7.7	138	SB	2	C		95		F
MANI	13	0521E	0521U	0534D	S17	W73	.950		7.7	13D	SB	3	C		60		
MANI	13	0521E	0521U	0534D	S15	W 1	.145	15697	13.1	13D	1B	3	C		400		FDE
MANI	13	0523E	0525	0536	S16	W55	.815		9.1	13D	SN	3	C		30		F
MANI	13	0645	0646	0655	S17	W54	.806		9.2	10	SN	3	C		40		
MANI	13	0646	0650	0654	S14	E 6	.163		13.7	8	SN	3	C		20		
MANI	13	0754E	0755	0804D	S16	W57	.834		9.1	10D	SB	3	C		60		
MONT	13	0856	0904	0912D	S16	W07	.200		12.8	16D	SF		C	0904	50		
RAMY	13	1202	1213	1225	S19	W84	.991		7.2	23	SB	3	C		25		
RAMY	13	1215	1215	1219	S17	E 4	.191		13.8	4	SN	3	C		22		F
RAMY	13	1234	1234	1241	S15	W 8	.198		12.9	7	SB	3	C		33		F
RAMY	13	1408	1408	1410	S19	W85	.993		7.2	2	SB	3	C		13		
RAMY	13	1432	1432	1502	S19	W21	.404		12.0	30	SB	3	C		87		DE
RAMY	13	1442	1450	1451	S19	W85	.993		7.2	9	SB	3	C		7		F
RAMY	13	1622	1623	1632	S15	W10	.222		12.9	10	SB	3	C		40		
RAMY	13	1627	1631	1653	S19	W86	.995		7.2	26	SB	3	C		26		
RAMY	13	1657	1704	1741	S15	W11	.235		12.9	44	SB	3	C		69		
RAMY	13	1717	1718	1733	S19	W86	.995		7.3	16	SB	3	C		12		
RAMY	13	1736	1741	1744	S19	W86	.995		7.3	8	SB	3	C		0		
RAMY	13	1746	1750	1759	S17	E 1	.179		13.8	13	SN	3	C		53		
RAMY	13	1756	1800	1805	S15	W11	.235		12.9	9	SB	3	C		74		
RAMY	13	1802	1826	1906	S19	W87	.996		7.2	64	SB	3	C		0		
RAMY	13	1838	1838	1846	S15	W11	.235		13.0	8	SB	3	C		41		
RAMY	13	1906	1925	1935	S19	W87	.996		7.3	29	SB	3	C		0		
RAMY	13	1952	1952	2006	S19	W88	.997		7.2	14	SB	3	C		0		
RAMY	13	2008	2011	2035	S19	W88	.997		7.2	27	SB	3	C		0		FDE
RAMY	13	2034	2046	2057D	S15	W13	.262	15697	12.9	23D	1B	3	C		222		FDE
RAMY	13	2037	2045	2057D	S17	W 1	.179		13.8	20D	SB	3	C		94		
TEHR	14	0355	0355U	0408D	S15	W80	.980		8.2	13D	SB	1	C		64		FDE
TEHR	14	0438E	0438U	0442D	S15	W14	.276		13.1	4D	SB	1	C		159		FDE
TEHR	14	0722	0724U	0735D	S15	W80	.980		8.3	13D	SB	1	C		64		FDE
TEHR	14	0900	0903	0908	S15	W14	.276		13.3	8	SB	2	C		95		FDE
RAMY	14	1258	1300	1310	S24	E40	.669		17.5	12	SN	3	C		25		
MCMA	14	1428E	1434	1451D	S17	W33	.556	15696	12.1	23D	SN		C	1434	60	.8	E
MCMA	14	1521E		1521D	S23	W15	.370	15696	13.5		SN		P	1521	35	.4	E
RAMY	14	1623	1625	1630	S19	W90	.999		7.9	7	SB	3	C		0		
MCMA	14	1649E		1653D	S16	W23	.412	15697	13.0	4D	SN		P	1650	60	.7	E
HOLL	14	1838	1840	1846	N23	W31	.675		12.5	8	SN	3	C		41		F
RAMY	14	1839	1840	1843	N21	W29	.640		12.6	4	SN	3	C		31		F
RAMY	14	1900E	1918	1945	S15	W25	.436		12.9	45D	SN	3	C		26		F
RAMY	14	2024	2034	2119D	S15	W26	.451		12.9	55D	SB	3	C		142		F
HOLL	14	2025	2033	2142	S15	W25	.436		13.0	77	SB	3	C		126		Z F
HOLL	14	2123	2214	2216D	N23	W33	.693		12.4	53D	SB	3	V		76		

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR. AREA Sq. Deg.	
HOLL	14	2213	2214	2216D	N23	W33	.693		12.5	3D	SB	3	C		76		
PALE	14	2214E	2215	2219	N21	W32	.668		12.5	5D	SN	3	C		20		F
PALE	14	2343E	2343U	0005	S19	W43	.689		11.8	22D	SB	3	C		74		FDE
TEHR	15	0645	0647	0655	N22	W36	.714		12.6	10	SN	1	C		64		FDE
MONT	15	0852	0858	0908	N22	W41	.760		12.3	16	SF		C	0858	50		E
TEHR	15	0857	0900	0907	N22	W36	.714		12.7	10	SB	1	C		127		FDE
RAMY	15	1205	1206	1210	N21	W38	.726		12.7	5	SN	3	C		40		
RAMY	15	1238	1238	1245	N21	W39	.735		12.6	7	SN	3	C		28		
RAMY	15	1303	1342	1517	N21	W40	.745		12.5	134	SB	3	C		106		
MCMA	15	1341E		1351D	N21	W43	.772	15700	12.3	10D	SN		P	1349	50	.8	E
RAMY	15	1443	1443	1454	S22	E44	.707		18.9	11	SF	3	C		26		
MCMA	15	1452	1502	1610D	S14	W28	.476	15697	13.5	78D	SN		C	1502	150	1.8	E
RAMY	15	1455	1457	1609	S15	W36	.591		12.9	74	SB	3	C		31		
RAMY	15	1457	1542	1637	S11	W31	.513		13.3	100	SN	3	C		65		
RAMY	15	1526	1533	1619	N21	W40	.745		12.6	53	SB	3	C		34		
RAMY	15	1529	1531	1539	S22	E44	.707		18.9	10	SF	3	C		38		
RAMY	15	1654	1656	1700	S15	W37	.604		12.9	6	SB	3	C		20		
RAMY	15	1657	1659	1704	N21	W41	.754		12.6	7	SN	3	C		20		
MCMA	15	1820	1826	1902D	S13	W36	.587	15697	13.1	42D	SN		C	1826	60	.8	E
RAMY	15	1830E	1830U	1933D	S11	W32	.528		13.4	63D	SB	2	C		96		F
RAMY	15	1848	1849	1854	S22	E42	.685		18.9	6	SF	2	C		35		
MCMA	15	1937E		1958D	S16	W42	.670	15697	12.7	21D	SF		C	1941	80	1.1	E
RAMY	15	1948E	1951	2001D	S12	W42	.665		12.7	13D	SN	2	C		73		F
RAMY	15	1948E	1957	2001D	S12	W42	.665		12.7	13D	SB	2	C		110		F
HOLL	15	2259E	2259U	2312D	S15	W39	.631		13.0	13D	SB	1	C		115		DE
RAMY	16	1651	1653	1658	N22	W57	.890		12.4	7	SB	3	C		76		F
MCMA	16	1651	1652	1656	N22	W58	.897	15700	12.4	5	SN		C	1652	40	1.0	E
RAMY	16	1707	1708	1710	N19	W 5	.444		16.3	3	SF	3	C		26		
RAMY	16	1715	1720	1735	N19	W 5	.444		16.3	20	SN	3	C		60		
RAMY	16	1740	1743	1749	N19	W 5	.444		16.4	9	SF	3	C		29		F
RAMY	16	1806	1806	1816	S18	W38	.624		13.9	10	SN	3	C		20		F
RAMY	16	1808	1810	1819	S22	E29	.527		18.9	11	SB	3	C		72		F
MCMA	16	1815E		1857	N19	W06	.447	15704	16.3	42D	SN		C	1835	80	.9	E
MCMA	16	1900		1907D	N19	W06	.447	15704	16.3	7D	SN		P	1902	50	.5	E
RAMY	16	1901	1905	1917	N19	W 6	.447		16.3	16	SB	3	C		55		F
RAMY	16	1957	1958	2003	N22	W58	.897		12.5	6	SN	2	C		39		
RAMY	16	2036	2040	2050	S15	W51	.773		13.0	14	SN	2	C		31		
MANI	17	0350E	0350U	0402D	N18	W10	.451		16.4	12D	SN	3	C		20		
MANI	17	0559E	0559U	0604D	S25	E 6	.325		17.7	5D	SN	3	C		15		
TEHR	17	0733	0743	0806	S15	W51	.773	15697	13.5	33	1B	1	C		286		F
MANI	17	0734E	0741	0754	S17	W48	.742	15714	13.7	20D	1B	3	C		250		FDE
RAMY	17	1217	1218	1241	N18	W16	.492		16.3	24	SB	3	C		24		
RAMY	17	1357	1358	1524	N18	W16	.492		16.4	87	SN	3	C		52		F
RAMY	17	1357	1427	1524	N18	W16	.492		16.4	87	SB	3	C		151		F
MCMA	17	1432	1500	1535	S23	E22	.447	15709	19.3	63	SN		C	1500	75	.9	E
RAMY	17	1433	1434	1521	S25	E24	.488		19.4	48	SB	3	C		86		F
MCMA	17	1507	1512	1522	S17	W62	.877	15697	13.0	15	SF		C	1512	30	.8	D
RAMY	17	1526	1532	1537	N18	W17	.501		16.4	11	SN	3	C		21		
MCMA	17	1545	1552	1604	S17	W49	.753	15697	14.0	19	SB		C	1552	100	1.6	E
RAMY	17	1549	1552	1558	S18	W49	.754		14.0	9	SB	3	C		50		F
MCMA	17	1549	1550	1557	N24	W70	.965	15700	12.4	8	SB		C	1550	25	1.0	D
RAMY	17	1550	1550	1554	N20	W66	.941		12.7	4	SB	3	C		20		
RAMY	17	1553	1557	1634	N18	W18	.509		16.3	41	SB	3	C		68		F
MCMA	17	1607	1608	1617	S17	W49	.753	15697	14.0	10	SF		C	1608	50	.8	D
MCMA	17	1609	1613	1624	S14	W60	.860	15697	13.2	15	SN		C	1613	40	.9	E
MCMA	17	1645	1656	1702D	N18	W20	.527	15704	16.2	17D	SB		C	1656	100	1.2	EK
RAMY	17	1646	1650	1653	N18	W18	.509		16.3	7	SB	3	C		73		F
RAMY	17	1654	1657	1717	N18	W18	.509	15704	16.4	23	1B	3	C		239		DE
RAMY	17	1718	1719	1730	N18	W18	.509		16.4	12	SN	3	C		25		F
RAMY	17	1731	1735	1755	N18	W19	.518		16.3	24	SB	3	C		59		F
MCMA	17	1800E	1811	1833	S14	W60	.860	15697	13.3	33D	1B		C	1811	100	2.4	E
MCMA	17	1800	1824	1833	N18	W20	.527	15704	16.3	33	SN		C	1824	80	1.0	E
RAMY	17	1807	1808	1850	S16	W62	.877		13.1	43	SB	3	C		120		DE
RAMY	17	1815	1825	1838	N18	W19	.518		16.3	23	SB	3	C		143		
PALE	17	1821E	1825	1849	N19	W19	.529	15704	16.3	28D	1B	3	C		234		FDE
PALE	17	1821E	1821U	1826	S15	W64	.892		13.0	5D	SB	3	C		110		FDE
PALE	17	1850E	1915U	1934	N19	W20	.538		16.3	44D	SN	3	C		68		FDE
RAMY	17	1855	1907	1936	N18	W19	.518		16.4	41	SB	3	C		75		
RAMY	17	1857	1858	1931D	N18	W16	.492		16.6	34D	SN	3	C		52		F

Hα SOLAR FLARES

DECEMBER 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
RAMY	17	1912	1920	1934	S16	W63	.885		13.1	22	SB	3	C		14		F
PALE	17	1935	1936	1939	N19	W20	.538		16.3	4	SN	3	C		47		
PALE	17	2000	2024	2057	N19	W20	.538		16.3	57	SB	3	C		134		FDE
PALE	17	2011E	2013	2017D	S15	W65	.900		13.0	6D	SN	3	C		42		FDE
PALE	17	2058	2102	2128	S16	W65	.900		13.0	30	SB	3	C		97		FDE
PALE	17	2111	2114	2133	N19	W21	.547		16.3	22	SN	3	C		93		DE
PALE	17	2129	2129	2134	S22	E20	.415		19.4	5	SN	3	C		30		DE
PALE	17	2250E	2252	2310D	N19	W22	.556		16.3	20D	SN	3	C		41		FDE
TEHR	18	0859E	0900U	0912	S58	W17	.796		17.1	13D	SB	2	C		95		
RAMY	18	1416	1418	1444	S16	W74	.955		13.0	28	SB	2	C		33		F
MCMA	18	1545	1548	1552	N16	W76	.980	15697	13.0	7	SN		C	1548			D
MCMA	18	1633	1636	1656	N12	W85	.998	15697	12.3	23	1B		C	1636			AR
MANI	18	2348	2350	0004	S20	W90	.999	15697	12.2	16	1B	3	C		0		
PALE	19	0032E	0034	0044	N12	E41	.707		22.1	12D	SN	3	C		42		F
TEHR	19	0833E	0836	0844	S18	W70	.933		14.1	11D	SB	2	C		95		F
RAMY	19	1839	1839	1852	N18	W45	.777		16.4	13	SN	3	C		20		
RAMY	19	1940	1941	1947	S18	W78	.972		14.0	7	SN	3	C		0		
RAMY	20	1621	1622	1624	N11	E17	.418		22.0	3	SN	2	C		26		H
HOLL	20	2011	2015	2024	N19	W61	.910		16.3	13	SN	2	C		20		
HOLL	20	2155	2202	2226	N12	E15	.409		22.0	31	SN	2	C		52		
PALE	20	2155E	2203	2218	N11	E15	.397		22.0	23D	SB	2	C		77		FDE
HOLL	20	2213	2213	2216	N19	W62	.916		16.3	3	SN	2	C		15		F
HOLL	20	2251	2253	2257	N19	W62	.916		16.3	6	SN	2	C		38		
PALE	21	0040	0042	0044	N19	W64	.928		16.2	4	SN	3	C		22		
TEHR	21	0730E	0730U	0743D	S27	W46	.742		17.9	13D	SN	1	C		64		FDE
RAMY	21	1312E	1314	1317	N10	E56	.851		25.8	5D	SN	3	C		18		
RAMY	21	1451	1451	1501	N10	E55	.842		25.7	10	SN	3	C		16		
RAMY	21	1645	1649	1722	N18	W71	.963		16.4	37	SB	2	C		92		F
HOLL	21	1646	1650	1742	N19	W71	.964	15704	16.4	56	1B	3	C		152		U F
PALE	21	1858	1859	1906	S25	W53	.805		17.8	8	SN	3	C		14		
RAMY	21	1905	1907	1914	N21	W72	.970		16.4	9	SB	2	C		19		
HOLL	21	1907	1908	1912	N19	W72	.968		16.4	5	SB	3	C		24		
PALE	21	1907	1908	1911	N19	W74	.976		16.2	4	SB	3	C		29		
RAMY	21	1925	1927	1939	S23	W36	.617		19.1	14	SN	2	C		36		
HOLL	21	2136	2139	2143	N19	W73	.972		16.4	7	SB	3	C		25		F
PALE	21	2137	2139	2142	N19	W73	.972		16.4	5	SB	3	C		32		
RAMY	22	1257	1308	1317	S23	W45	.720		19.2	20	SB	3	C		84		F
RAMY	22	1620	1620	1629	N24	W32	.695		20.3	9	SN	2	C		53		F
RAMY	22	1720	1720	1727	N24	W32	.695		20.3	7	SN	2	C		22		F
MCMA	22	1836	1840	1846	N28	E90	1.002	15731	1.5	10	SN		C	1840			DH
TEHR	23	0514	0520	0524	S23	W61	.871		18.6	10	SB	1	C		127		DE
MANI	23	0516E	0516U	0625	S26	W60	.866		18.7	69D	SN	3	C		20		
RAMY	23	1550	1551	1603	N11	E28	.548		25.8	13	SB	3	C		32		F
MCMA	23	1626	1628	1643	N27	E75	.985	15731	1.3	17	SN		C	1628			E
RAMY	23	1628	1629	1633	N28	E72	.977		1.1	5	SN	3	C		12		
RAMY	23	1903	1917	1924	N17	W59	.892		19.4	21	SN	3	C		84		F
HOLL	23	1905	1911	1924	N17	W58	.884		19.4	19	SN	3	C		21		
RAMY	23	1932	1935	1946	N17	W59	.892		19.4	14	SN	3	C		78		F
PALE	24	2043	2044	2054	N19	E 2	.442		25.0	11	SN	3	C		37		DE
TEHR	25	0453	0456	0508D	N12	E50	.802		1.0	15D	SB	1	C		95		FDE
PALE	25	2022	2022	2024	S15	E71	.939		3.2	2	SN	3	C		17		DE
HOLL	25	2022	2022	2027	S17	E68	.920		2.9	5	SN	3	C		38		
HOLL	25	2131	2136	2152	S30	E62	.885		2.5	21	SB	3	C		76		
PALE	25	2133	2136	2155D	S28	E67	.916	15734	2.9	22D	1B	3	C		171		H
MANI	26	0327E	0327U	0334	S15	E60	.859		2.6	7D	SB	3	C		100		F
RAMY	27	1236	1237	1246	S18	E51	.775		3.4	10	SN	3	C		22		
RAMY	27	1551	1551	1554	S15	E41	.655		2.7	3	SN	3	C		22		
RAMY	27	1626	1637	1813	S13	E41	.653	15733	2.8	107	3B	3	C		883		U F
HOLL	27	1627	1631	1634D	S16	E43	.681	15733	2.9	7D	2B	3	C		393		UDE
RAMY	27	1629	1633	1642	S18	E71	.938		5.0	13	SB	3	C		51		F
PALE	27	1759	1801	1802	S23	W46	.730		24.3	3	SN	3	C		17		DE
RAMY	27	1759	1800	1804	S22	W47	.739		24.2	5	SN	3	C		19		

Hα SOLAR FLARES

DECEMBER 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COORD.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
PALE	28	0046	0047	0111D	S15	E41	.655		3.1	25D	SB	3	C		41		DE
RAMY	28	1153	1154	1204	S35	E86	.992		6.9	11	SN	2	C		0		
RAMY	28	1328	1328	1350	N11	E 4	.319		28.9	22	SN	3	C		23		
RAMY	28	1401	1401	1404	S15	E33	.549		3.1	3	SN	3	C		24		
RAMY	28	1501	1534	1625	N11	E 3	.316		28.9	84	SB	2	C		53		
MCMA	28	1532	1542	1551	S29	W90	.998	15714	21.9	19	SN		C	1542			E
RAMY	28	1626	1629	1649	N11	E 3	.316		28.9	23	SN	2	C		39		
RAMY	28	1629	1632	1634	S32	E50	.795		4.4	5	SF	2	C		18		
RAMY	28	1637	1638	1643	S32	E50	.795		4.4	6	SF	2	C		32		
MCMA	28	1703		1708D	S13	E30	.501	15733	3.0	5D	SF		P	1707	80	1.0	E
RAMY	28	1744	1747	1750	S22	W62	.878		24.1	6	SN	2	C		14		
RAMY	28	1836	1836	1841	N11	E 2	.314		28.9	5	SN	2	C		33		
RAMY	28	1920	1925	1928	N11	E 1	.313		28.9	8	SN	2	C		31		
RAMY	28	2003	2003	2010	N11	E 1	.313		28.9	7	SN	2	C		23		
RAMY	28	2024	2034	2042D	S32	E47	.768		4.4	18D	SB	2	C		50		
PALE	28	2154E	2157U	2158D	S23	W64	.893		24.1	4D	SB	3	C		32		DE
RAMY	29	1350	1352	1357	S22	W73	.949		24.1	7	SN	2	C		33		
MANI	30	0549	0607	0620	S20	E67	.913	15746	7.3	31	2B	2	C		300		U
TEHR	30	0604E	0608U	0702	S12	E63	.884	15741	7.0	58D	3B	2	C		732		U
RAMY	30	1200	1202	1220	S32	E27	.578		4.5	20	SN	3	C		25		
RAMY	30	1216	1220	1234	N13	E74	.971		8.1	18	SN	3	C		16		
RAMY	30	1332	1332	1342	S31	E 4	.408		2.9	10	SN	3	C		28		
RAMY	30	1507	1507	1511	N11	W23	.489		28.9	4	SN	3	C		32		
RAMY	30	1609	1611	1627	N11	W24	.501		28.9	18	SB	3	C		80		
RAMY	30	1725	1725	1728	S22	E19	.399		4.2	3	SN	3	C		20		
RAMY	30	1833	1847	1855	S22	E19	.399		4.2	22	SN	3	C		33		
PALE	30	2305	2306	2321	S11	E54	.803		7.0	16	SN	2	C		66		DE
PALE	30	2332	2333	2336	S21	E15	.342		4.1	4	SN	2	C		28		DE
TEHR	31	0802	0805	0812	N13	E64	.918		8.1	10	SB	2	C		95		
RAMY	31	1213E	1214	1245	S32	E14	.469		4.6	32D	SN	2	C		74		U F
RAMY	31	1316	1316	1321	N12	E60	.888		8.1	5	SN	3	C		23		
RAMY	31	1446	1447	1507	S12	E45	.702		7.0	21	SN	3	C		28		
RAMY	31	1645	1650	1657	S23	E 6	.289		4.1	12	SN	2	C		45		
RAMY	31	1726	1727	1741	S23	E 6	.289		4.2	15	SN	2	C		80		
RAMY	31	1906	1906	1909	N12	E57	.865		8.1	3	S3	2	C		19		

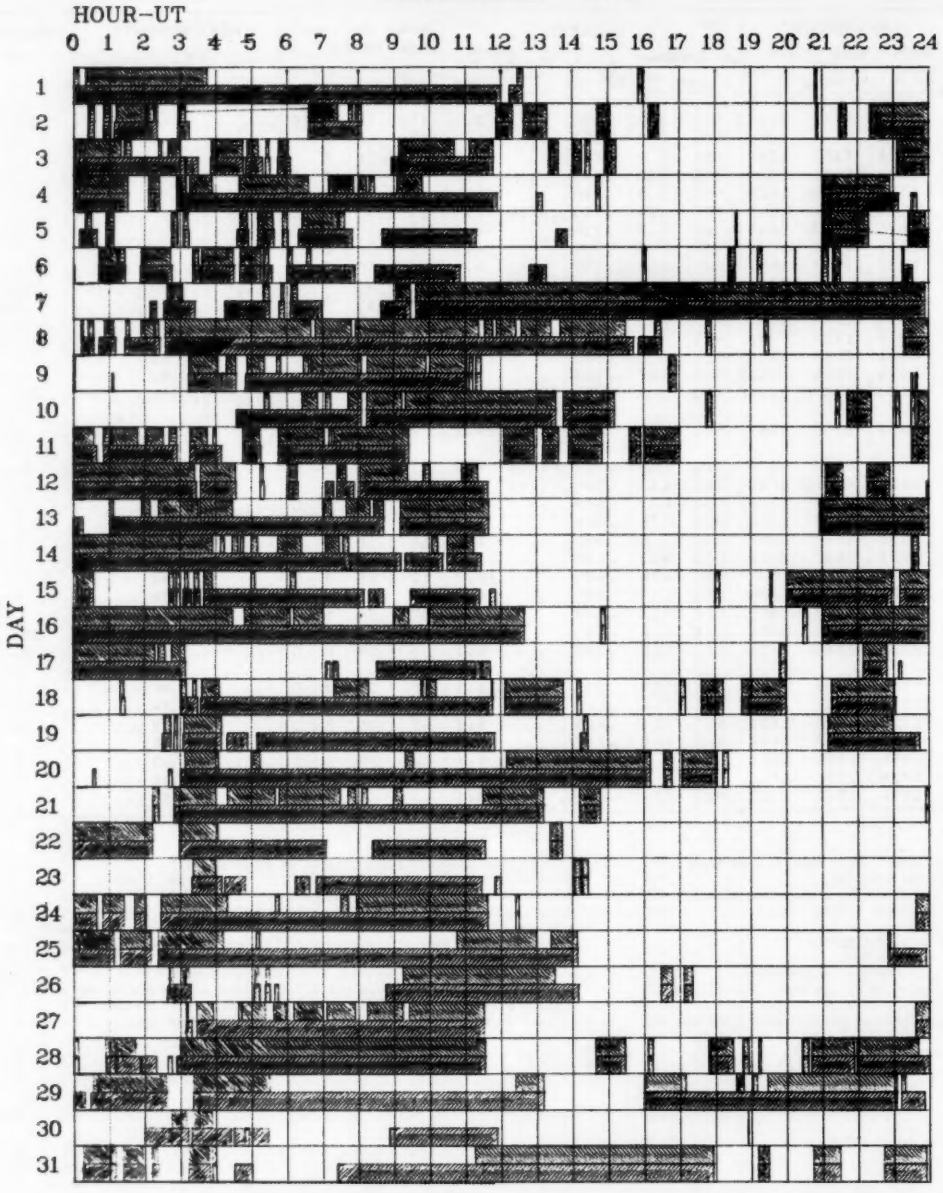
"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

DECEMBER 1978

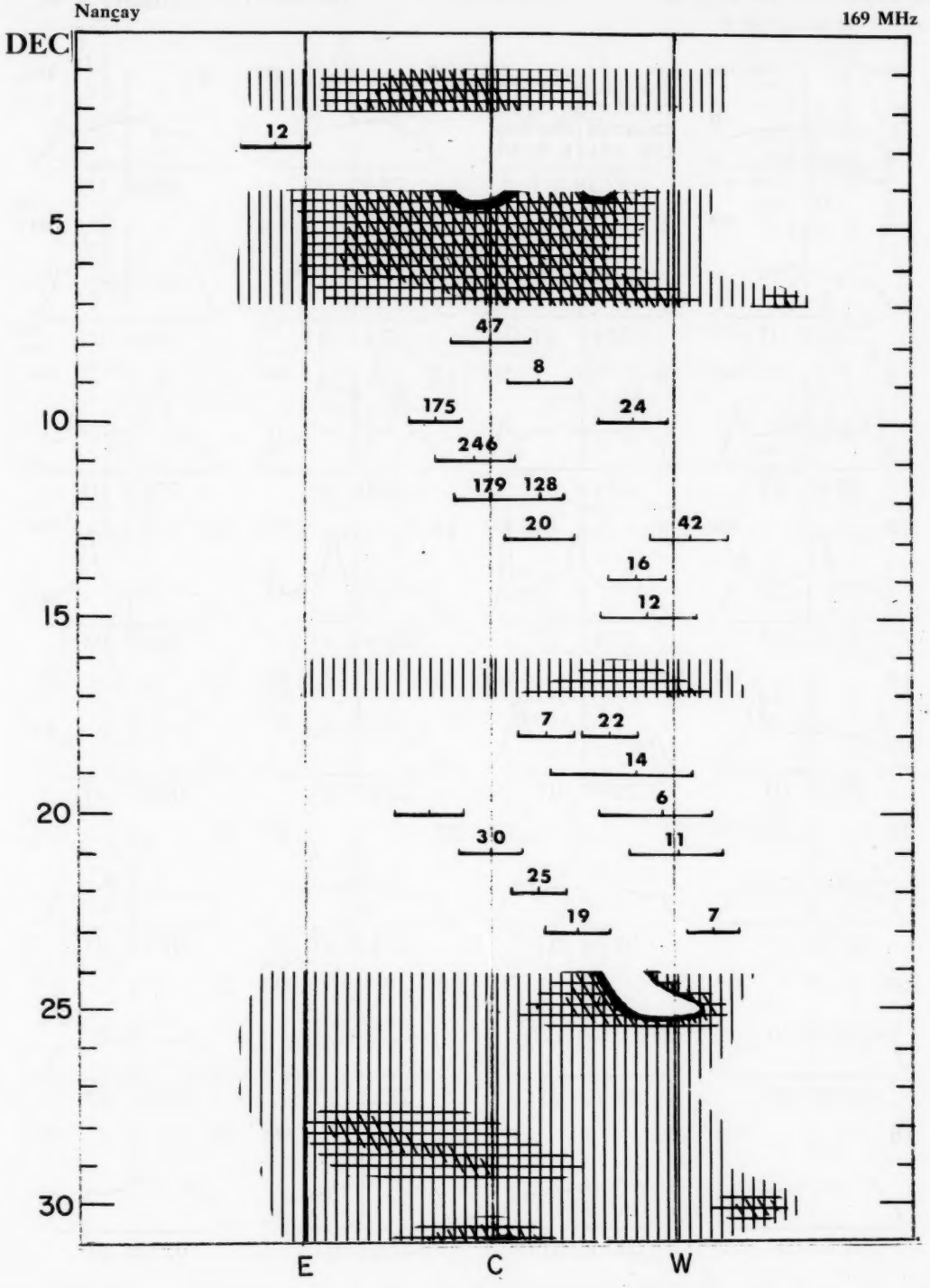


Bucharest	Kandilli	McMath-Hulbert	Ramey	Upice
Herstmonceux	Locarno	Monte Mario	Tehran	Wendelstein
Holloman	Manila	Palehua		

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

DECEMBER 1978



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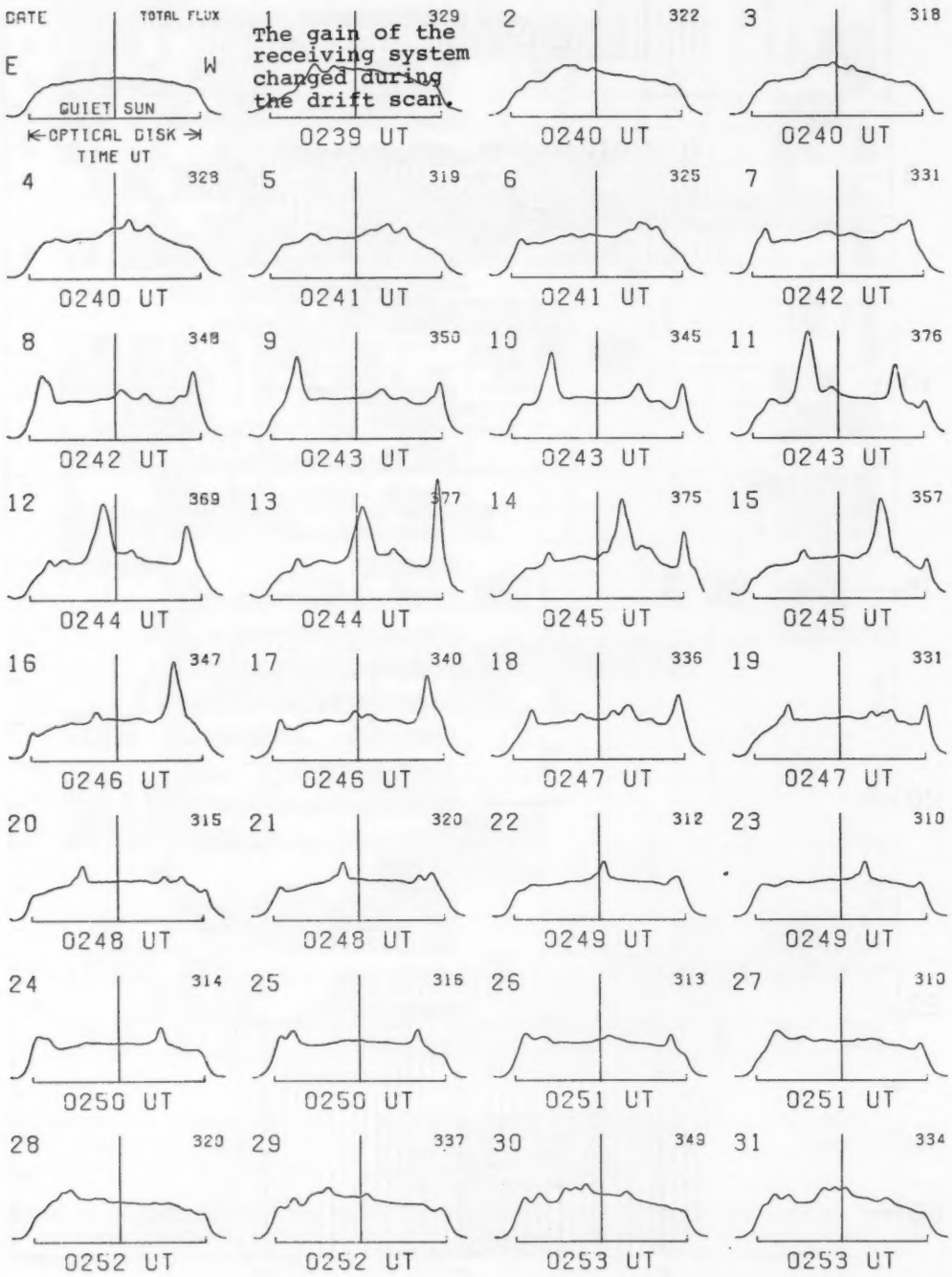
Dec 78

EAST-WEST SOLAR SCANS
DECEMBER 1978

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC

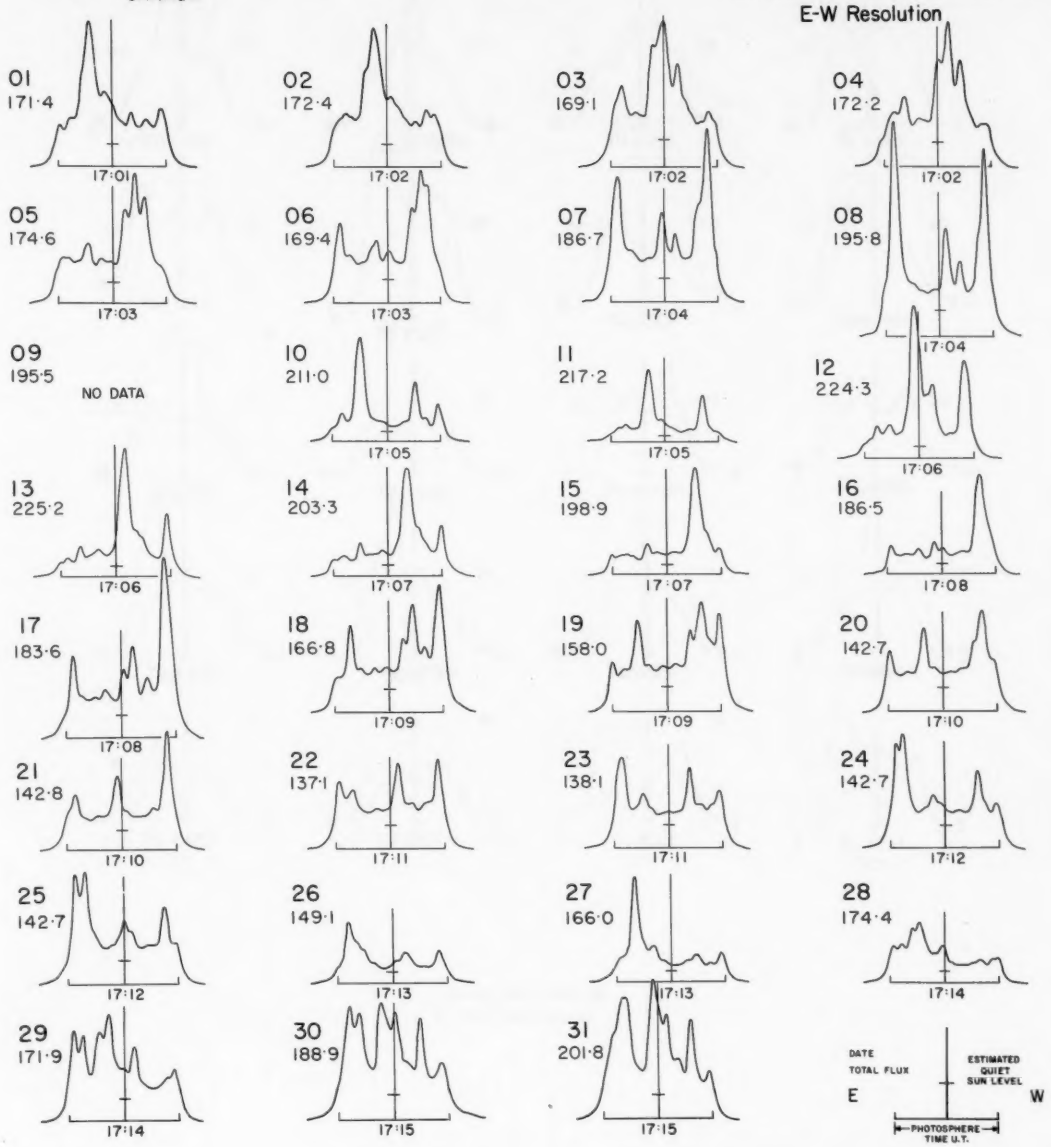


EAST-WEST SOLAR SCANS

DECEMBER 1978

ALGONQUIN RADIO OBSERVATORY
CANADA

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution

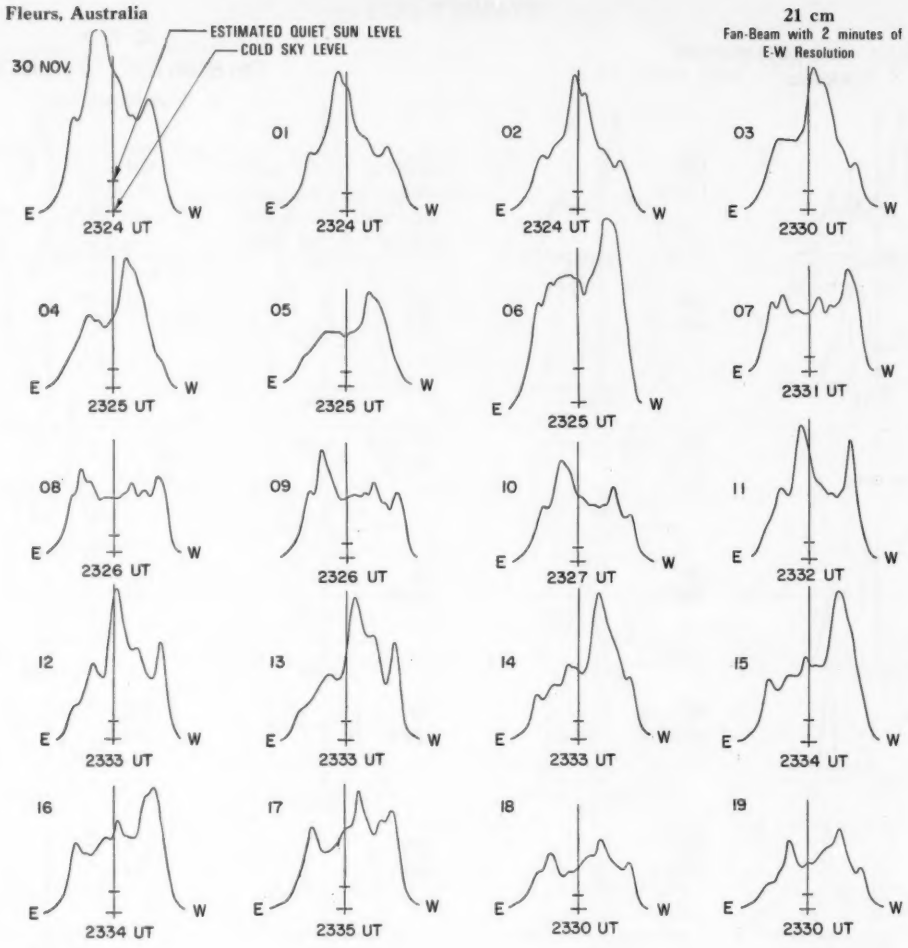


EAST-WEST SOLAR SCANS

DECEMBER 1978

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



NO DATA DEC. 20-31

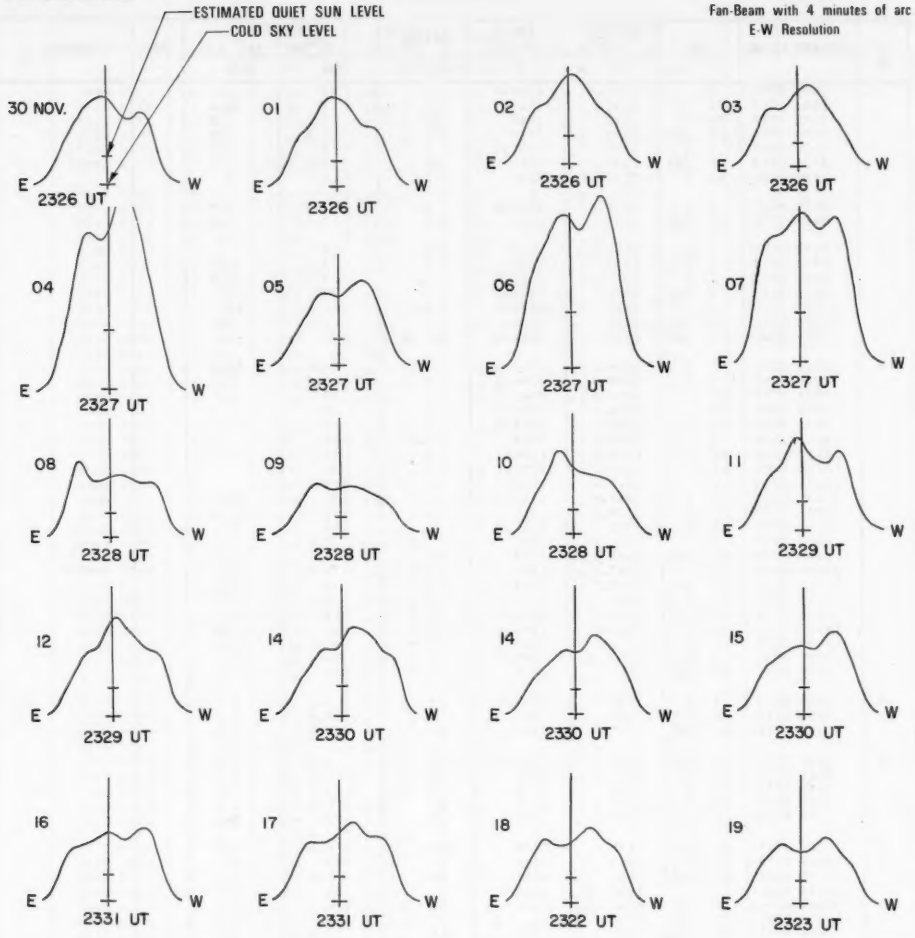
EAST-WEST SOLAR SCANS

DECEMBER 1978

Fleurs, Australia

43 cm

Fan-Beam with 4 minutes of arc E-W Resolution



NO DATA DEC. 20-31

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

DECEMBER 1978

DEC 1978	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
1	8400	BERN	3	1213.2	1214.8	11	20			0
	2800	CTTA	20 GRF	1440	1447	18	3	1.4		
	2800	OTTA	240 R	1512	1545	33	3	1.5		
	2800	OTTA	20 GRF	1650	1720	130	2.6	1.3		
	2800	OTTA	1 S	1954	1955.5	3	9	4.5		
	2800	OTTA	29 PBI	1957	1957	15	3.4	1.7		
	2695	BOUL	41 F	2152 E	2154	2.5D	16	5		
2	2695	MANI	3 S	0548.4	0550.6	4.7	23.3	7.7		
	2800	OTTA	20 GRF	1455	1545	175	3.4	2.8		
3	8400	BERN	3	1108.6	1109	6	19			0
	2800	OTTA	1 S	1839	1840	2	3.4	1.7		
	2800	OTTA	8 S	1937.5	1937.8	.5	3.4	1.7		
	2800	OTTA	4 S/F	2031	2032.2	3	78	26		
	2695	BOUL	4 SF	2032	2033.5	5.5	32	11		
	2800	OTTA	29 PBI	2034	2034	4	2.4	1.2		
	2695	BOUL	31 ABS	2037.5	2044.5	11 D	-5	-2		
4	8800	MANI	3 S	0545.2	0546.5	2	54.5	36.3		
	2695	MANI	1 S	0545.5	0546.7	3	6.8	4.5		
	8400	BERN	45	0934.1	0941.1	7	30			30R
	8400	BERN	45	0934.1	0938.2	7	27			11R
	8400	BERN	46	1054.3	1055.6	9	42			0
	8400	BERN	3	1227.6	1229	3.5	35			0
	8400	BERN	45	1249.3	1256.3	8	23			0
	8400	BERN	45	1249.3	1250.1	8	21			0
	8400	BERN	8	1318.4	1320.3	12	298			11L
	2695	SGMR	3 S	1318.5	1319.5	1.5	139	55.6		5
	8800	SGMR	3 S	1318.5	1319.5	1.5	94	37.6		5
	2800	OTTA	3 S	1320	1320.3	2	105	30		
	2800	OTTA	8 S	1431.8	1432	.7	3.4	1.7		
	2800	OTTA	22 GRF	1458	1508	40	4	1.9		
	2695	SGMR	3 S	1547.1	1548	2.2	72.6	29		5+SWF
	2800	OTTA	4 S/F	1547.5	1548.3	3.5	48	18.6		
	2800	OTTA	1 S	1719	1720	3	3	1.5		
	2800	OTTA	4 S/F	1843.5	1844.5	6.5	74	12		
	8800	SGMR	3 S	1844.4	1844.8	4.6	68	27.2		
	2695	SGMR	3 S	1844.4	1844.8	4.6	10.7	42.8		
	2695	BOUL	3 S	1845 D	1845.5	1 D	89	30		
	2695	BOUL	29 PBI	1846	1846	1.5D	11	4		
5	2800	OTTA	1 S	1422.2	1422.5	1	9.2	4		
	2800	OTTA	4 S/F	1425	1425.7	1.5	16.4	8		
	2800	OTTA	20 GRF	1935	1943	20	2.4	1.2		
6	2800	OTTA	20 GRF	1505	1550	170	4.2	2.2		
	2800	OTTA	20 GRF	1843.5	1856	40	4.4	2.2		
	2800	OTTA	1 S	1939	1940	2	3.4	1.7		
	2695	PENT	240 R	2018	2045	27	2.8	1.4		
	2695	PENT	4 S/F	2103	2105	5	20	9.6		
7	2800	OTTA	20 GRF	1635	1720	145	5.4	2.7		
	2800	OTTA	4 S/F	1940	1944	18	97	35		
	2695	SGMR	20 GRF	1942	1945	16	5.5	2		
	2695	BOUL		1942 D	1950.5		68	23		
	2695	BOUL	21 GRF	1942 D	1945	18 D	104	35		
	2695	BOUL	29 PBI	1952	1952	5 D	34	11		
	2800	OTTA	30 PBI	1958	1958	110	10.8	5.4		
	2695	PENT	8 S	2033.9	2034.3	.7	1.6	.8		
	2695	PENT	8 S	2035	2035.2	.6	4	2		
8	2800	OTTA	20 GRF	1455	1505	25	2.2	1.1		
	2800	OTTA	27A RF	1530		230	3.8	3.4		
	2800	OTTA	24 R	1530	1550	20	3.8	2.2		
	2800	OTTA	24P R	1550		180	3.8			
	2800	OTTA	8 S	1608.8	1609	.5	8.8	4.4		
	2800	OTTA	8 S	1616.5	1616.8	.5	7.6			
	2800	OTTA	26 FAL	1850	1920	30	-3.8	-1.9		
	2800	OTTA	32 ABS	1935	1950	30	-3	-1.8		
	2695	PENT	1 S	2019	2020	4	5.4	2.5		
	2695	PENT	20 GRF	2030	2033	25	3.2	1.6		
9	8400	BERN	3	1058.1	1101	10	39			11L
	2800	OTTA	20 GRF	1420	1440	70 D	3			
	2800	OTTA	27 RF	1535		220	5	4.2		
	2800	OTTA	24 R	1535	1555	20	5	2.5		
	2800	OTTA	24P R	1555		150	5			
	2800	OTTA	26 FAL	1825	1915	50	5	2.5		
10	2800	OTTA	27AFRF	1505		225	3.8	3.6		
	2800	OTTA	24 R	1505	1525	20	3.8	2		
	2800	OTTA	24P R	1525		191	3.8			
	2800	OTTA	22 GRF	1805	1818.5	30	5.6	2.2		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

DECEMBER 1978

DEC 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	REMARKS
	2800	OTTA	26 FAL	1836	1850	14	-3.8	-1.9		
	2800	OTTA	23 GRF	1930	2004	35 D	8.4			
	2800	OTTA	40 F	1946.2	1947.2	2	80			
	2695	SGMR	3 S	1946.8	1947.4	1.6	48	14.4		
	2695	MANI	3 S	2330.2	2340.1	46.7	98	32.7		
	8800	MANI	3 S	2338.5	2346.6	45.7	28.7	9.6		
11	8400	BERN	8	0946	0946.3	1	15			0
	2800	OTTA	240 R	1553	1603	10	6	3		
	2800	OTTA	240 R	1720	1740	20	4.2	2.1		
	2800	OTTA	21 GRF	1750	1809	40	7.2	4.5		
	2800	OTTA	1 S	1752	1754	4	5.8	2.9		
	2695	BOUL	28 PRE	1909.5U	1944	43.5D	290	97		
	2800	OTTA	28 PRE	1910		22	19			
	8800	SGMR	47 GB	1918	1946.1	107 D	280	1660		SWF
	2695	SGMR	47 GB	1918	2011.5		24600			SWF
	2695	SGMR	47 GB	1918	1946.1	107 D	333	9840		SWF
	8800	SGMR	47 GB	1918	2005.2		4150			SWF
	2800	OTTA	47 GB	1934	2012	160	8320	1128		
	2695	BOUL	47 GB	1953 E	2013.5	43.5D	14332	4777		
	2695	BOUL	29 PBI	2036.5	2036.5	118.5U	2149	716		
	2695	PENT	29 PBI	2214	2214	40 D	20			
12	8800	MANI	3 S	0308.4	0309.2	6.4	80	26.6		
	8800	MANI	3 S	0640.4	0641	1	24	8		
	2695	MANI	3 S	0640.6	0640.8	1	10.2	3.4		
	8400	BERN	2	0939	1031.5	243	67			0
	8400	BERN	2	0939	1211.2	243	47			0
	2800	OTTA	23 GRF	1420	1625	285	46			
	2800	OTTA	1 S	1432	1433	4	3.8	1.7		
	8800	SGMR	45 C	1512	1513.3	29	263	190		
	2695	SGMR	45 C	1512	1517.2		277			
	2695	SGMR	45 C	1512	1513.3	29	29.5	111		
	8800	SGMR	45 C	1512	1517.2		474			
	2800	OTTA	4 S/F	1512	1517	15	185	27		
	2695	BOUL	3 S	1517.5E	1518.5	5 D	203	68		
	2800	OTTA	1 S	1652	1654.5	6	3	1.4		
	2695	PENT	1 S	1850	1851	1.5	5.4	2		
	2800	OTTA	1 S	1856	1856.5	1	3	1.5		
	2695	PENT	21 GRF	1945	2013.5	65	7.6	2.8		
	2695	PENT	1 S	2036	2037	6	6.2	3.1		
13	8800	MANI	3 S	0119.1	0121.2	4	11	3		IG
	2695	MANI	3 S	0120.2	0121.2	3.5	13.4	4.5		
	8800	MANI	3 S	0406.2	0406.9	3.1	91	30		
	2695	MANI	4 S/F	0430.1	0433.8	10.8	60.1	20.1		
	8800	MANI	3 S	0517.4	0518.6	2.6	236.6	78.9		
	8400	BERN	2	1005	1015.5	86	90			0
	8400	BERN	3	1233	1233.5	6	64			0
	2800	OTTA	1 S	1330	1333	6	4.6	2		
	2800	OTTA	21 GRF	1427	1440	35	3.6	1.8		
	2695	SGMR	3 S	1431.6	1432.5	1.7	18	5.4		
	2800	OTTA	3 S	1431.9	1432.4	1	10.4	5.2		
	2800	OTTA		1652	1704	50	12			
	2800	OTTA	240 R	1833	1925	52	11.4	5.7		
	2695	PENT	21 GRF	2020	2044	60	9.2	4.4		
	2695	PENT	2 S/F	2027	2028	2.5	4.2	2.1		
	2800	OTTA	8 S	2045.2	2045.5	.8	2.6	1.3		
	8800	MANI	47 GB	2352.7	2354.3	6.3	1575	509.8		
	2695	MANI	3 S	2352.8	2354.5	7	18.4	6.1		
14	2695	MANI	4 S/F	0431.1	0433	7.1	38.7	12.9		
	8800	MANI	47 GB	0722.5	0723.1	5.1	966.9	322.3		
	2695	MANI	3 S	0722.8	0723.3	5	52.4	17.4		
	8400	BERN	8	0903.1	0903.5	1	15			
	2800	OTTA	27 RF	1428		140	4.6	4.2		
	2800	OTTA	24 R	1428	1432	4	4.6	2.3		
	2800	OTTA	24P R	1432		118	4.6			
	2800	OTTA	26 FAL	1630	1648	18	4.6	2.3		
	2800	OTTA	20 GRF	1840	1851	90	6	2.8		
	2800	OTTA	20 GRF	2015	2037	50	10.6	3.6		
	2695	PENT	26 FAL	2115	2145	30	-6.4			
	2695	PENT	3 S	2212.5	2213.7	2	11.2	3.8		
15	2800	OTTA	20 GRF	1450	1520	70	4	2		
	2800	OTTA	1 S	1800	1807	8	2.8	1.4		
	2800	OTTA	21 GRF	1820	1850	60	3	1.5		
	2800	OTTA	1 S	1822	1823	2	3.6	1.8		
	2695	PENT	26 FAL	2005	2020	15	-3.6	-1.8		
	8800	MANI	4 S/F	2241	2242.9	3.2	115.4	38.5		
	2695	BOUL	4 SF	2243 E	2244 U	2.5U	17	6		
	2695	BOUL	29 PBI	2245.5U	2245.5U	2.5U	11	4		
16	2695	MANI	4 S/F	0135.6	0136	3.5	51.7	17.2		
	2695	MANI	3 S	0351	0351.9	2	32.8	10.9		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS
DECEMBER 1978

DEC 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	REMARKS
	2695	PENT	240 R	1955	2005	10	3	1.5		
	2695	PENT	20 GRF	2025	2030	45	3.8	1.8		
17	2695	MANI	4 S/F	0348	0349.3	4.2	21.2	7.1		
	2695	MANI	4 S/F	0732.7	0735.3	25.3	244.5	81.5		
	8400	BERN	8	1134.2	1134.7	1.5	22			16L
	2800	OTTA	21 GRF	1420	1500	120	7.4	3.8		
	2800	OTTA	8 S	1616.8	1616.8	.5	4			
	2695	SGMR	3 S	1807.8	1808.4	1.4	66.3	19.9		SWF
	8800	SGMR	3 S	1807.9	1808.4	1.3	93.8	28.1		SWF
	2800	OTTA	3 S	1807	1808.2	5	58	20		
	2695	BOUL	3 S	1808 E	1809	2 D	62	21		
	2695	BOUL	29 PBI	1810	1810	25.5	16	5		
	2800	OTTA	30 PBI	1812	1812	28	8.4	4.2		
	2800	OTTA	8 S	1815	1815.3	.6	3.4	1.7		
	2800	OTTA	8 S	1907.1	1907.1	.1E	4.2			
	2800	OTTA	26 FAL	1910	1945	35	-7.4	-3.7		
	2800	OTTA	8 S	1956.3	1956.3	.1E	2.8			
	2800	OTTA	1 S	2023	2023.3	1	1.4	.7		
18	2800	OTTA	4 S/F	1635.5	1636	3	10.6	2.6		
	2800	OTTA	26 FAL	1710	1755	45	-3.2	-1.6		
	2695	PENT	1 S	2017.9	2018.2	1	2.6	1.3		
	2695	PENT	8 S	2153.9	2154	.2	2.8	1.4		
	2695	MANI	4 S/F	2347.6	2348.1	3.7	23.8	17.5		
	8800	MANI	4 S/F	2347.6	2349	1.4	421.2	269.7		I
19	2800	OTTA	240 R	1430	1500	30	3.6	1.8		
	2800	OTTA	26 FAL	1720	1840	80	-6.2	-4		
21	2800	OTTA	21 GRF	1520	1655	180	6.4	3.2		
	2800	OTTA	2 S/F	1646.5	1648	2.5	5.2	2.6		
	2800	OTTA	2 S/F	1731.8	1733.5	2.2	9.2			
	2695	BOUL	3 S	1734.5E	1735	1 D	20	7		
	2800	OTTA	21 GRF	1855	1910	65	1.8			
	2800	OTTA	40 F	1957	1957.7	2	11.4			
22	2800	OTTA	23 GRF	1832	1837	28	6.6	2.2		
	2800	OTTA	1 S	1841	1841.2	1	8.6	4.3		
23	2800	OTTA	1 S	1731	1731.4	2.5	7.4	3		
	2800	OTTA	1 S	2028	2029	2	3	1.3		
	2695	PENT	1 S	2052	2054.5	4.5	2.6			
	2695	PENT	40 F	2226	2226.5	9	13			
	2695	BOUL	22 GRF	2227.5E	2234.5	10 D	15	5		
24	2800	OTTA	20 GRF	1455	1650	225	4	2		
25	2695	MANI	1 S	0003.1	0006.4	4.9	7.9	2.6		
	2800	OTTA	20 GRF	1510	1525	50	2.2	1.1		
26	2800	OTTA	20 GRF	1950	1955	15	1.4	.7		
27	2800	OTTA	240 R	1505	1515	10	2.6	1.3		
	2595	SGMR	47 GB	1627.8	1638.1	39.2	548	162		2,SWF
	2800	OTTA	4 S/F	1627	1637.5	31	380	117		
	2695	BOUL	45 C	1628 E	1639	17 D	420	140		
	8800	SGMR	3 S	1629	1637.3	36	428	128		2,SWF
	2695	BOUL	29 PBI	1645	1645	17	44	15		
	2800	OTTA	29 PBI	1658	1658	80	13.8	7.2		
28	2800	OTTA	240 R	1455	1540	45	5.4	2.5		
	2800	OTTA	20 GRF	1755	1810	30	2.6	1.3		
	2800	OTTA	20 GRF	1900	1912	60	4.8			
	2695	PENT	1 S	2106	2108	5	1.4	.7		
29	2800	OTTA	20 GRF	1810	1912	80	2.8	1.4		
	2695	PENT	20 GRF	2010	2055	90	2	1.2		
30	2695	MANI	3 S	0600 E	0605	11 D	29	9.7		
	2695	MANI	4 S/F	0852.5	0852.9	2	24.6	8.2		I
	2800	OTTA	21 GRF	1530	1620	110	3.8	1.9		
	2800	OTTA	1 S	1608.5	1610	10	6	2.4		
	2800	OTTA	22 GRF	1735		45	2.2			
	2695	PENT	20 GRF	1835	1900	45	2	1.1		
	2695	PENT	240 R	2030	2056	26	2.8			
31	2800	OTTA	20 GRF	1550	1612	70	14	4.6		
	2800	OTTA	20 GRF	1724	1727	20	2	1		
	2800	OTTA	40 F	1805	1806.8	3	5			
	2800	OTTA	3A S	1905.8	1906.5	2	45	12		
	2800	OTTA	8 S	1906.5	1906.5	.1E	57			
	2695	BOUL	8 S	1907 E	1907.5	1 D	90	30		
	2695	PENT	3 S	2112	2112.8	2	12.4	4.2		
	2695	BOUL	3 S	2113 E	2114	1.5D	13	4		

Observatories:

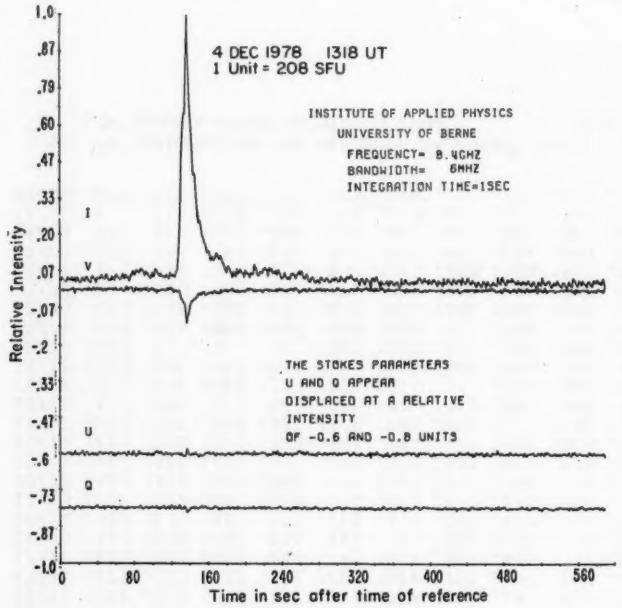
BERN = Berne BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

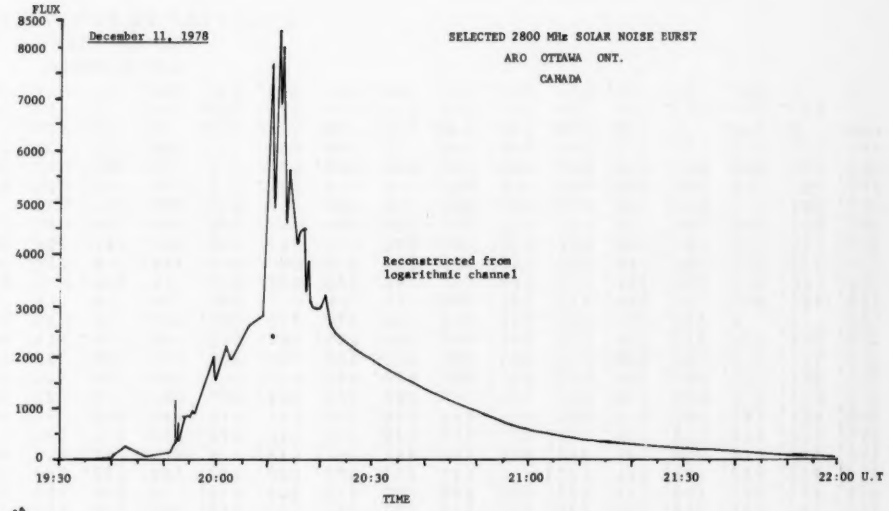
Explanation of Type Code:

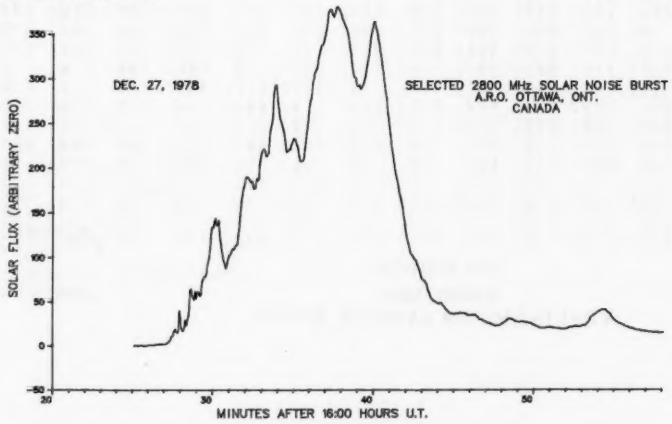
1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

SELECTED SOLAR NOISE BURSTS

DECEMBER 1978







SOLAR X-RAYS BY SATELLITE
SMS GOES
DECEMBER 1978

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
12/ 1	.001	.002	.002	.001	B	.001	B	.002	B	B	B	B	.004	B	.003	B	B	.003	B	.007	.002	B	.005	.001	.002
12/ 2	B	.001	.001	.001	.157	.004	.005	.001	.002	.003	.006	B	B	B	B	B	B	B	B	B	B	B	B	B	.009
12/ 3	B	B	B	.001	.001	B	B	B	B	B	B	.014	.024	.022	.002	.001	B	B	.002	B	.052	B	.001	.002	.005
12/ 4	.005	.001	.007	B	B	.019	B	B	.002	M	.017	.007	.002	.011	.001	.015	.002	.011	.015	B	B	B	B	B	.005
12/ 5	.005	.001	B	.015	B	B	B	.020	.003	.001	B	B	B	B	B	B	B	B	.002	.002	.001	.001	B	.002	.003
12/ 6	.001	.001	.002	.002	B	B	.001	.001	B	.001	.003	F	.001	.002	B	.002	.002	.002	.004	.009	.002	.013	.013	.006	.003
12/ 7	.017	.003	.004	.001	.002	.002	.003	.004	.001	.005	.070	.002	.001	.002	.001	B	.001	.002	.002	.052	.031	.002	.009	.033	.010
12/ 8	.012	.002	B	B	.005	.001	.002	.002	.002	.017	.013	.007	.002	.002	.003	B	.001	.002	.001	.001	.005	.001	.003	B	.005
12/ 9	.002	.013	.001	.002	.002	.003	.002	.002	.002	.001	.002	.003	.001	.001	.003	.017	.002	.002	.009	.004	.003	.001	.002	.004	.005
12/10	.001	.001	.009	.002	.005	.005	.006	.002	.003	.001	.003	.005	B	.010	.003	.004	.001	.002	.004	.005	.011	.003	.001	.117	.011
12/11	.175	.006	.007	.005	.009	.002	.002	.004	.001	.002	.005	.005	.001	.002	.003	.007	.007	.012	.077	1.03	.002	.105	.005	.014	.007
12/12	.012	.003	.015	.001	.047	.072	.041	.002	.059	.003	.500	.255	.021	.010	.013	1.65	.154	.054	.055	.002	.105	.025	.003	.271	.135
12/13	.240	.009	.007	.056	.714	.045	.743	.274	.012	.010	.334	.009	.012	.004	.010	.007	.009	.021	.120	.733	.007	.013	.004	.054	.135
12/14	.609	.005	.016	.057	.127	.013	.003	.442	.005	.005	.014	.002	.002	.003	.043	.003	.043	.004	.007	.010	.053	.007	.003	.005	.064
12/15	.002	.002	.002	.003	.004	.010	.005	.041	.035	.002	.002	B	.002	.007	.005	.009	.003	.003	.013	.007	.003	.009	.047	.015	.010
12/16	.001	.006	.002	.009	.007	.015	.002	.002	.002	.007	.011	.002	.001	M	.003	.002	.003	.002	.002	.002	.004	.002	.001	.002	.005
12/17	.002	.002	.012	.017	.007	.001	.002	.452	.051	.012	.007	.005	.051	.002	.006	.007	.016	.005	.127	.014	.004	.005	.001	.004	.035
12/18	.004	.002	.003	.002	.003	.002	.002	.040	.004	.002	.458	.003	.002	.003	.009	.003	.007	.006	.002	.029	.003	.111	.003	.059	.032
12/19	.003	.002	.001	.002	.002	.002	.002	.002	.009	.012	.012	B	.002	.002	.004	.001	.001	.019	.019	.002	.001	.011	B	B	.005
12/20	B	.002	B	.001	.001	.001	.012	.003	.012	B	B	B	B	.001	B	B	B	.001	.012	.014	.012	.011	.014	.001	.004
12/21	B	.002	.001	B	.005	B	B	.003	.001	.003	B	.004	B	.003	.002	.002	.001	.013	.002	.012	.011	.012	.001	.013	.009
12/22	.002	.001	.002	.002	.011	.002	.002	.001	.002	B	.005	B	.014	.006	.002	.015	.010	.011	.013	.005	.001	.011	.001	.011	.005
12/23	.002	B	B	B	.003	.005	.013	.040	.002	.002	.004	.005	.012	.007	.001	B	.004	.003	.005	.003	.003	.005	.053	.045	.012
12/24	.005	.002	.007	.002	.002	.002	B	.001	.034	.011	.002	.005	.002	.001	.002	.004	.001	.011	.005	B	B	.001	.045	.010	.012
12/25	.005	.001	.002	.002	.007	.001	.014	.011	.010	B	.012	.003	.012	.001	.001	.010	B	.002	.002	.002	.002	.003	B	.001	.007
12/26	.004	.001	.001	.007	.004	.013	.003	.001	.002	.011	.005	.001	B	B	.001	B	B	.003	B	.001	.012	.005	B	.002	.007
12/27	B	.002	B	B	B	B	.003	.002	B	.001	.011	.002	B	B	.003	.001	.502	.002	.017	.013	.014	.003	.003	.042	.035
12/28	.002	.003	.043	.001	.003	.002	.001	.004	.015	.002	.002	.045	.003	.001	.003	.002	.012	.002	.002	.003	.002	.003	.002	.015	.009
12/29	.002	.002	.001	.002	.001	.002	.002	.001	.001	B	.003	.001	B	.004	.013	.012	.014	.013	.013	.003	.012	B	.001	B	.007
12/30	B	.005	.003	.004	.001	.003	.007	.015	.005	.001	.055	.015	.005	.003	.002	.002	.001	.013	.003	.002	.009	.002	.015	.013	.025
12/31	.003	.003	.015	.014	.005	.003	.003	.004	.014	.002	.005	.002	.005	.011	.005	.007	.001	.013	.005	.002	.002	.007	.001	B	.010

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
DECEMBER 1978

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO	DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
12/	1	.010	.015	.020	.010	.009	.010	.009	.010	.008	.007	.007	.023	.015	.023	.011	.008	.008	.008	.009	.013	.012	.009	.022	.008	.006
12/	2	.003	.009	.009	.009	.115	.012	.013	.009	.009	.210	.279	.223	.005	.029	.009	.009	.007	.007	.007	.007	.007	.007	.025	.010	
12/	3	.025	.006	.006	.007	.007	.007	.006	.006	.005	.005	.007	.035	.040	.012	.011	.010	.008	.008	.009	.008	.032	.009	.009	.009	.003
12/	4	.012	.010	.014	.008	.008	.022	.009	.007	.012	M	.016	.013	.009	.012	.008	.024	.008	.007	.017	.007	.007	.007	.006	.007	.008
12/	5	.012	.023	.007	.013	.007	.007	.007	.024	.021	.012	.008	.008	.008	.007	.007	.008	.008	.008	.010	.009	.009	.008	.023	.012	.005
12/	6	.009	.008	.012	.011	.009	.008	.008	.009	.009	.010	.013	.008	.011	.013	.009	.011	.011	.011	.013	.021	.013	.025	.014	.017	.008
12/	7	.040	.022	.018	.013	.013	.012	.014	.014	.012	.020	.075	.015	.012	.014	.012	.011	.011	.017	.014	.049	.051	.022	.027	.043	.017
12/	8	.029	.019	.017	.013	.019	.014	.014	.033	.014	.035	.038	.009	.021	.015	.022	.017	.017	.015	.015	.017	.023	.017	.020	.017	.012
12/	9	.015	.014	.012	.017	.018	.017	.019	.015	.025	.013	.014	.008	.014	.021	.032	.012	.013	.013	.032	.014	.023	.014	.015	.013	.012
12/10		.014	.012	.048	.013	.035	.025	.041	.026	.013	.013	.015	.024	.017	.032	.034	.034	.030	.017	.022	.022	.034	.022	.019	.035	.019
12/11		.135	.072	.036	.029	.032	.022	.020	.023	.015	.013	.021	.025	.013	.014	.019	.017	.025	.029	.092	.545	.553	.129	.052	.042	.091
12/12		.033	.031	.046	.107	.035	.104	.032	.257	.032	.033	.311	.117	.055	.035	.039	.751	.194	.092	.273	.249	.113	.040	.051	.020	.125
12/13		.175	.127	.113	.055	.432	.245	.405	.109	.033	.044	.034	.036	.036	.024	.033	.023	.029	.045	.102	.055	.020	.053	.060	.153	.124
12/14		.355	.259	.044	.057	.123	.032	.013	.211	.025	.020	.033	.055	.018	.015	.043	.015	.048	.013	.021	.027	.072	.025	.017	.037	.061
12/15		.013	.013	.012	.015	.017	.019	.017	.035	.027	.013	.013	.011	.013	.023	.025	.027	.019	.019	.035	.027	.025	.023	.048	.033	.015
12/16		.019	.019	.013	.013	.035	.034	.013	.013	.013	.021	.013	.013	.012	M	.017	.015	.015	.014	.012	.011	.013	.020	.014	.012	.011
12/17		.012	.013	.032	.030	.023	.012	.012	.035	.034	.033	.024	.027	.043	.015	.048	.032	.021	.019	.072	.015	.014	.015	.013	.011	.035
12/18		.018	.013	.015	.014	.014	.014	.013	.013	.024	.015	.039	.014	.013	.025	.019	.014	.015	.023	.012	.012	.013	.032	.193	.043	.035
12/19		.013	.013	.012	.013	.013	.032	.014	.013	.019	.015	.013	.011	.012	.012	.013	.016	.011	.012	.013	.012	.008	.008	.008	.007	.009
12/20		.007	.007	.008	.008	.008	.009	.013	.033	.012	.007	.025	.023	.005	.006	.007	.007	.009	.012	.008	.008	.012	.010	.009	.008	
12/21		.009	.010	.009	.008	.042	.008	.007	.008	.008	.009	.009	.007	.007	.017	.012	.012	.056	.029	.011	.010	.008	.008	.007	.023	.012
12/22		.008	.021	.008	.010	.025	.025	.471	.393	.012	.008	.012	.009	.010	.029	.011	.023	.010	.009	.025	.027	.008	.008	.007	.008	.028
12/23		.007	.006	.005	.005	.010	.022	.013	.051	.013	.010	.015	.014	.007	.007	.012	.009	.025	.015	.015	.014	.011	.012	.043	.037	.013
12/24		.023	.050	.029	.014	.011	.012	.009	.009	.013	.027	.012	.010	.023	.009	.025	.025	.010	.009	.010	.008	.008	.010	.056	.037	.015
12/25		.025	.011	.012	.010	.031	.010	.017	.009	.008	.007	.007	.008	.007	.006	.007	.005	.005	.007	.007	.007	.007	.007	.006	.007	.008
12/26		.010	.009	.010	.015	.019	.034	.031	.013	.009	.008	.013	.012	.005	.007	.009	.008	.007	.009	.006	.007	.007	.007	.006	.008	.009
12/27		.007	.008	.007	.005	.005	.007	.008	.012	.008	.008	.009	.011	.008	.008	.008	.012	.321	.115	.020	.050	.013	.014	.013	.015	.032
12/28		.014	.011	.031	.011	.016	.019	.014	.013	.014	.013	.014	.015	.015	.013	.014	.014	.014	.015	.017	.021	.020	.013	.015	.016	.012
12/29		.014	.014	.011	.013	.027	.012	.013	.012	.011	.011	.012	.011	.012	.009	.010	.009	.012	.013	.013	.011	.012	.010	.012	.008	.009
12/30		.012	.012	.010	.019	.014	.070	.254	.049	.027	.013	.025	.017	.019	.022	.017	.015	.016	.012	.012	.011	.010	.012	.011	.030	.029
12/31		.015	.011	.010	.030	.019	.013	.011	.013	.017	.017	.018	.014	.023	.017	.013	.013	.025	.013	.013	.013	.011	.012	.011	.010	.013

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES

DECEMBER 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
1	1212	0.0E+00	6.9E-07	1221	1.4E-07	3.1E-06	1234	2.6E-08	1.8E-06
1	1443	6.8E-09	8.2E-07	1450	2.0E-07	3.5E-06	1455	3.1E-08	2.0E-06
1	1952	1.5E-08	9.5E-07	1958	7.1E-07	6.8E-06	2003	9.9E-08	3.2E-06
1	2223	4.1E-08	1.4E-06	2229	8.7E-07	7.1E-06	2231	3.5E-08	1.3E-06
2	0401	1.1E-08	9.0E-07	0409	1.0E-05	1.4E-06	0412	1.9E-08	1.1E-06
2	0435	1.5E-05	1.8E-06	0439	1.0E-06	8.6E-06	0443	1.8E-07	4.8E-06
2	0546	8.7E-09	8.5E-07	0602	2.7E-07	4.2E-06	0614	8.8E-08	2.5E-06
2	0739	7.0E-09	7.8E-07	0742	5.1E-08	1.3E-06	0746	1.4E-08	1.0E-06
2	0800	2.3E-08	1.0E-06	0803	8.1E-08	1.7E-06	0807	4.4E-08	1.3E-06
3	0452	4.2E-09	6.0E-07	0458	1.2E-07	2.3E-06	0502	2.7E-08	1.3E-06
3	1101	4.5E-08	1.3E-06	1138	2.2E-07	4.8E-06	1213	7.5E-08	3.0E-06
3	1836	6.2E-09	7.3E-07	1841	2.3E-07	2.5E-06	1845	7.7E-08	1.5E-06
3	2028	1.5E-08	9.7E-07	2035	5.7E-06	2.4E-05	2038	7.7E-07	8.4E-06
3	2300	6.2E-09	7.9E-07	2305	4.0E-08	1.2E-06	2312	1.0E-08	9.9E-07
3	2356	1.1E-08	8.9E-07	0002	5.3E-07	4.2E-06	0006	1.0E-07	2.2E-06
4	0205	2.3E-08	1.1E-06	0216	3.4E-07	3.4E-06	0223	6.8E-08	1.9E-06
4	0541	2.8E-08	1.1E-06	0547	2.3E-06	1.3E-05	0550	4.6E-07	5.3E-06
4	1052	8.6E-09	7.6E-07	1058	2.6E-06	1.3E-05	1102	6.4E-07	6.2E-06
4	1318	6.4E-09	7.0E-07	1322	1.8E-06	9.7E-06	1324	6.4E-08	2.1E-06
4	1434	5.5E-09	6.7E-07	1437	1.1E-07	1.9E-06	1439	2.4E-08	1.0E-06
4	1456	9.5E-09	8.0E-07	1510	6.9E-07	6.6E-06	1514	1.3E-07	3.6E-06
4	1545	4.1E-09	6.7E-07	1550	8.2E-07	7.2E-06	1552	2.0E-07	3.7E-06
4	1842	6.0E-09	6.5E-07	1846	2.1E-06	1.2E-05	1850	3.0E-07	5.1E-06
4	1933	9.2E-09	7.2E-07	1936	4.3E-08	1.0E-06	1938	1.2E-08	8.1E-07
5	0735	3.7E-08	1.2E-06	0752	8.0E-07	7.5E-06	0803	1.7E-07	4.2E-06
5	0810	9.5E-08	2.7E-06	0814	5.0E-07	5.6E-06	0817	1.4E-07	3.7E-06
5	0943	9.5E-09	8.9E-07	0946	6.1E-08	1.6E-06	0948	2.1E-08	1.0E-06
5	1203	8.7E-09	8.2E-07	1206	6.2E-08	1.9E-06	1208	1.3E-08	9.7E-07
5	1421	3.3E-09	6.8E-07	1425	6.0E-08	1.4E-06	1427	7.3E-09	8.1E-07
5	2118	9.3E-09	8.3E-07	2122	5.1E-08	1.3E-06	2126	1.4E-08	1.0E-06
5	2219	8.9E-09	7.6E-07	2222	3.7E-08	1.1E-06	2224	1.6E-08	9.0E-07
5	2314	9.3E-09	7.8E-07	2320	1.1E-07	2.1E-06	2325	3.9E-08	1.4E-06
6	0005	5.1E-09	7.3E-07	0008	8.3E-08	1.9E-06	0010	4.8E-08	1.2E-06
6	0332	1.5E-08	1.1E-06	0337	5.9E-08	1.8E-06	0340	3.3E-08	1.4E-06
6	0717	7.3E-09	8.4E-07	0721	4.9E-08	1.2E-06	0725	1.4E-08	1.0E-06
6	1543	1.2E-08	1.1E-06	1546	5.4E-08	1.9E-06	1558	2.7E-08	1.4E-06
6	1843	8.9E-09	9.3E-07	1859	1.4E-07	3.1E-06	1906	2.8E-08	2.0E-06
6	1936	1.2E-08	1.0E-06	1943	5.9E-07	7.0E-06	1947	2.3E-07	3.9E-06
6	2101	6.6E-09	9.5E-07	2108	8.9E-07	7.9E-06	2116	1.6E-07	4.4E-06
6	2334	2.7E-08	1.3E-06	0021	2.4E-07	5.0E-06	0054	1.0E-07	3.1E-06
7	0221	3.1E-08	1.3E-06	0229	1.5E-07	2.9E-06	0244	3.6E-08	2.1E-06
7	0632	2.6E-08	1.4E-06	0635	2.8E-08	2.2E-06	0637	3.1E-08	1.5E-06
7	0915	2.2E-08	1.8E-06	0921	1.3E-07	3.0E-06	0927	4.0E-08	2.3E-06
7	0955	1.1E-08	1.6E-06	1004	4.8E-06	3.3E-05	1009	1.2E-06	1.6E-05
7	1939	2.3E-08	1.4E-06	1951	2.3E-06	2.0E-05	2008	7.5E-07	1.0E-05
7	2226	1.1E-08	1.8E-06	2234	3.9E-07	5.8E-06	2242	1.2E-07	3.6E-06
7	2340	1.2E-08	1.6E-06	2346	2.3E-06	1.8E-05	2353	1.0E-06	1.0E-05
8	0048	3.1E-09	1.7E-06	0052	8.6E-07	6.5E-06	0058	2.1E-07	3.9E-06
8	0357	2.2E-10	1.7E-06	0403	1.5E-07	3.4E-06	0409	3.6E-08	2.4E-06
8	0723	6.1E-09	1.3E-06	0726	3.4E-09	1.0E-05	0731	0.0E+00	1.4E-06
8	1414	1.0E-08	1.7E-06	1424	9.7E-08	2.9E-06	1434	3.0E-08	2.3E-06
8	2040	2.0E-08	1.4E-06	2050	1.5E-07	3.5E-06	2102	3.7E-08	2.4E-06
9	1056	6.0E-08	2.1E-06	1100	2.9E-06	1.8E-05	1103	9.3E-07	9.9E-06
9	2049	1.3E-08	1.6E-06	2052	1.2E-07	2.7E-06	2055	3.2E-08	2.1E-06
9	2342	1.5E-08	1.6E-06	2349	1.7E-07	3.2E-06	2358	4.6E-08	2.3E-06
10	0201	3.0E-08	1.5E-06	0209	2.7E-06	2.0E-05	0215	9.6E-07	1.0E-05
10	0440	1.1E-08	1.6E-06	0448	1.5E-06	1.1E-05	0457	3.4E-07	6.5E-06
10	0602	2.2E-08	1.5E-06	0611	1.1E-06	8.4E-06	0624	2.2E-07	4.9E-06
10	0825	3.3E-08	1.8E-06	0829	2.7E-07	4.1E-06	0833	9.1E-08	2.8E-06
10	1339	7.2E-08	2.7E-06	1355	2.9E-07	6.2E-06	1411	1.2E-07	4.3E-06
10	1534	1.4E-08	1.5E-06	1545	1.4E-07	3.5E-06	1551	2.8E-08	2.5E-06
10	1816	4.2E-08	2.2E-06	1821	1.8E-07	3.7E-06	1828	7.6E-08	2.9E-06
10	2332	3.2E-08	1.9E-06	0003	4.0E-06	3.0E-05	0029	1.2E-06	1.6E-05

SOLAR X-RAYS BY SATELLITE

GOES

DECEMBER 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
11	1001	2.2E-08	1.6E-06	1005	1.2E-07	2.5E-06	1011	4.1E-08	2.0E-06
11	1909	1.7E-07	5.8E-06	1927	1.3E-05	7.5E-05	1937	0.0E+00	0.0E+00
11	1937	6.0E-06	4.3E-05	1945	2.3E-05	1.1E-04	2017	1.0E-05	7.7E-05
12	0012	1.3E-07	3.6E-06	0017	3.3E-07	5.4E-06	0023	1.5E-07	4.4E-06
12	0131	1.5E-07	4.5E-06	0136	3.9E-06	2.1E-05	0147	8.9E-07	1.2E-05
12	0306	2.2E-07	5.5E-06	0314	3.2E-06	2.0E-05	0327	8.5E-07	1.2E-05
12	0343	3.0E-07	7.7E-06	0346	9.3E-07	1.1E-05	0348	3.6E-07	8.1E-06
12	0519	2.1E-06	1.1E-05	0522	2.2E-06	1.8E-05	0525	1.4E-06	1.4E-05
12	0638	1.6E-07	5.9E-06	0650	1.0E-06	1.2E-05	0655	3.9E-07	8.6E-06
12	0747	1.0E-07	4.0E-06	0755	5.5E-07	8.1E-06	0802	1.6E-07	5.9E-06
12	0826	2.5E-07	6.0E-06	0833	2.2E-06	1.4E-05	0844	6.7E-07	1.0E-05
12	0959	4.9E-08	3.1E-06	1040	1.1E-05	5.8E-05	1057	2.6E-06	2.9E-05
12	1329	9.0E-08	3.2E-06	1336	3.7E-07	6.5E-06	1343	1.4E-07	4.8E-06
12	1415	1.5E-07	3.8E-06	1419	4.6E-07	6.3E-06	1422	1.6E-07	5.0E-06
12	1509	5.1E-07	7.6E-06	1520	8.2E-05	2.5E-04	1527	2.6E-05	1.2E-04
12	1806	5.4E-07	5.6E-06	1811	1.5E-06	1.2E-05	1817	4.1E-07	8.4E-06
12	1832	1.0E-07	4.0E-06	1836	3.4E-06	1.8E-05	1840	9.7E-07	1.0E-05
12	2002	3.1E-07	5.6E-06	2011	2.0E-06	2.0E-05	2030	1.1E-06	1.2E-05
12	2133	1.4E-07	4.2E-06	2136	1.2E-06	1.0E-05	2140	3.2E-07	6.7E-06
12	2226	1.8E-07	4.8E-06	2230	1.2E-06	1.1E-05	2233	5.3E-07	7.7E-06
13	0008	1.4E-07	4.3E-06	0014	5.6E-06	2.5E-05	0026	1.5E-06	1.4E-05
13	0037	3.6E-06	1.9E-05	0042	6.1E-06	3.2E-05	0050	2.8E-06	2.4E-05
13	0109	1.0E-06	1.2E-05	0120	2.4E-06	2.1E-05	0128	1.2E-06	1.7E-05
13	0231	9.4E-07	1.2E-05	0237	2.3E-06	2.0E-05	0240	1.2E-06	1.5E-05
13	0352	3.2E-07	5.5E-06	0410	2.8E-05	9.5E-05	0422	6.0E-06	4.9E-05
13	0516	1.3E-06	1.9E-05	0521	9.7E-06	4.9E-05	0528	3.5E-06	3.3E-05
13	0615	3.9E-07	1.0E-05	0622	3.6E-05	1.2E-04	0633	9.3E-06	6.0E-05
13	0736	3.3E-07	7.8E-06	0739	1.2E-06	1.1E-05	0743	6.6E-07	9.4E-06
13	1011	1.6E-07	3.6E-06	1019	2.0E-05	6.8E-05	1029	4.2E-06	3.4E-05
13	1429	6.0E-08	2.6E-06	1433	2.6E-07	5.1E-06	1459	1.0E-07	3.7E-06
13	1822	5.2E-07	6.7E-06	1831	4.5E-06	2.4E-05	1838	1.4E-06	1.5E-05
13	2006	1.6E-07	4.3E-06	2012	3.1E-06	1.6E-05	2018	1.0E-06	1.0E-05
13	2036	1.7E-07	4.6E-06	2046	2.3E-06	1.8E-05	2050	8.2E-07	1.0E-05
13	2351	2.0E-07	6.0E-06	0004	3.0E-05	1.1E-04	0016	6.3E-06	5.4E-05
14	0221	8.0E-08	3.5E-06	0228	6.5E-07	8.1E-06	0234	2.0E-07	5.6E-06
14	0350	2.5E-07	5.6E-06	0400	3.2E-06	1.9E-05	0414	1.0E-06	1.2E-05
14	0423	3.9E-07	7.8E-06	0435	2.0E-06	1.7E-05	0443	8.2E-07	1.2E-05
14	0647	1.2E-08	1.6E-06	0650	2.2E-07	3.2E-06	0657	6.0E-08	2.3E-06
14	0714	1.6E-08	1.8E-06	0725	3.2E-05	1.0E-04	0732	9.5E-06	5.2E-05
14	0854	7.6E-09	1.7E-06	0910	1.9E-07	3.5E-06	0914	6.8E-08	2.6E-06
14	1109	9.1E-08	3.0E-06	1119	6.6E-07	6.7E-06	1130	1.9E-07	4.7E-06
14	1359	3.4E-08	1.6E-06	1412	2.2E-06	1.1E-05	1422	4.7E-07	6.3E-06
14	1536	1.7E-08	1.2E-06	1540	2.1E-07	3.0E-06	1543	5.8E-08	2.0E-06
14	1619	2.5E-09	1.3E-06	1633	2.0E-06	1.2E-05	1642	4.3E-07	5.7E-06
14	1832	5.1E-08	1.9E-06	1837	2.1E-07	3.2E-06	1849	7.5E-08	2.5E-06
14	1900	6.7E-08	2.3E-06	1905	3.2E-07	4.4E-06	1913	1.3E-07	3.3E-06
14	2010	9.6E-09	1.6E-06	2015	1.0E-06	7.2E-06	2024	1.7E-07	4.2E-06
14	2029	1.7E-07	3.5E-06	2041	1.3E-06	9.8E-06	2055	3.3E-07	5.2E-06
14	2210	3.2E-08	1.5E-06	2214	9.6E-08	2.5E-06	2217	3.0E-08	1.3E-06
14	2307	2.8E-09	1.7E-06	2315	1.3E-06	9.8E-06	2325	2.2E-07	5.5E-06
15	0357	3.3E-08	1.5E-06	0403	1.5E-07	3.2E-06	0410	3.3E-08	2.3E-06
15	0456	1.7E-08	1.2E-06	0459	1.7E-07	2.4E-06	0505	2.3E-08	1.7E-06
15	0507	0.0E+00	1.5E-06	0512	4.3E-07	3.5E-06	0519	1.4E-07	2.5E-06
15	0552	2.7E-08	1.2E-06	0559	4.5E-07	4.3E-06	0605	1.3E-07	2.7E-06
15	0640	3.9E-08	1.2E-06	0643	4.9E-08	1.3E-06	0647	3.3E-08	1.5E-06
15	0721	3.7E-08	1.6E-06	0727	4.3E-07	4.5E-06	0735	1.4E-07	3.3E-06
15	0747	4.3E-08	1.3E-06	0754	2.1E-06	1.1E-06	0801	3.7E-07	6.2E-06
15	0854	4.4E-08	1.9E-06	0858	9.5E-08	2.7E-06	0900	4.2E-08	2.2E-06
15	1220	2.5E-08	1.3E-06	1223	5.5E-08	2.1E-06	1228	4.2E-08	1.5E-06
15	2203	5.8E-08	2.5E-06	2205	2.2E-07	3.8E-06	2209	7.2E-08	2.9E-06
15	2239	1.1E-07	2.6E-06	2251	1.7E-06	1.2E-05	2303	3.5E-07	7.2E-06
16	0116	2.1E-08	1.5E-06	0119	9.9E-08	2.5E-06	0121	2.2E-08	1.9E-06

SOLAR X-RAYS BY SATELLITE

GOES

DECEMBER 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
16	0134	1.8E-08	1.4E-05	0137	3.7E-07	6.4E-06	0140	1.2E-07	3.5E-06
16	0349	1.8E-08	1.2E-05	0407	6.3E-07	9.2E-06	0422	2.0E-07	5.1E-06
16	0516	3.1E-09	1.7E-05	0520	1.5E-07	3.2E-06	0624	3.9E-08	2.3E-06
16	0941	1.5E-08	1.6E-05	0951	3.9E-07	5.3E-06	0955	1.2E-07	3.5E-06
16	1643	1.2E-08	1.2E-06	1652	9.9E-08	2.3E-06	1655	1.9E-08	1.7E-06
17	0201	1.3E-08	1.2E-05	0215	3.1E-07	4.9E-06	0237	3.7E-08	3.1E-06
17	0340	2.0E-08	1.7E-05	0354	8.2E-07	7.7E-06	0405	2.1E-07	4.5E-06
17	0730	2.2E-08	1.4E-05	0743	1.7E-06	3.5E-06	0755	5.5E-06	4.3E-06
17	1353	2.4E-08	1.5E-05	1357	7.4E-08	2.2E-06	1403	1.5E-08	1.9E-06
17	1405	3.5E-09	1.5E-05	1427	2.3E-07	4.4E-06	1501	5.5E-08	2.9E-06
17	1552	3.6E-08	1.5E-06	1558	2.5E-06	1.4E-05	1700	4.4E-07	5.1E-06
17	1805	1.9E-08	1.3E-05	1810	3.2E-06	1.7E-05	1313	3.4E-07	8.9E-06
17	2000	3.0E-08	1.3E-05	2003	2.7E-07	3.2E-06	2007	5.5E-08	2.1E-06
17	2055	2.4E-08	1.1E-05	2102	1.5E-07	2.3E-06	2105	3.4E-08	1.3E-06
17	2107	3.3E-08	1.6E-05	2113	1.5E-07	2.6E-06	2115	5.2E-08	2.0E-06
18	0225	1.3E-08	1.1E-05	0233	1.0E-07	2.3E-06	0243	1.5E-08	1.7E-06
18	0839	1.8E-08	1.4E-05	0842	4.5E-07	4.6E-06	0844	5.9E-08	2.2E-06
18	0854	2.4E-08	1.4E-05	0859	1.7E-07	4.0E-06	0903	4.5E-08	2.4E-06
18	1152	3.7E-08	1.5E-05	1157	9.9E-08	2.3E-06	1201	2.3E-08	1.3E-06
18	1412	1.7E-08	1.2E-06	1422	4.3E-07	4.3E-06	1429	1.0E-07	2.3E-06
18	2344	1.3E-08	1.1E-06	2350	5.7E-06	3.5E-05	2354	1.1E-06	1.3E-05
19	0341	1.3E-08	1.2E-05	0344	4.5E-08	2.0E-06	0353	2.3E-08	1.5E-06
19	0353	1.1E-08	1.2E-05	0401	9.2E-08	2.3E-06	0404	2.7E-08	1.7E-06
19	0828	1.2E-08	1.2E-05	0837	5.2E-07	5.8E-06	0841	9.5E-08	3.3E-06
19	1359	1.9E-08	1.4E-05	1402	1.9E-07	3.0E-06	1409	2.5E-08	1.5E-06
20	0540	6.2E-09	3.5E-07	0543	1.0E-06	4.3E-06	0651	1.0E-07	2.3E-06
20	1330	3.5E-09	7.4E-07	1333	7.5E-06	1.4E-06	1335	1.1E-08	7.3E-07
20	1342	1.1E-08	7.8E-07	1345	1.0E-07	2.2E-06	1347	1.3E-08	7.7E-07
20	1904	9.8E-09	7.2E-07	1907	7.0E-06	1.3E-06	1909	1.0E-08	7.4E-07
20	1941	1.2E-08	7.7E-07	1944	5.3E-07	1.3E-06	1945	1.2E-08	7.3E-07
20	2012	2.0E-08	1.0E-06	2015	5.3E-06	1.5E-06	2013	2.6E-08	1.1E-06
20	2249	1.1E-08	8.5E-07	2252	4.5E-08	1.2E-06	2254	1.7E-08	1.0E-06
21	0100	2.9E-08	1.2E-05	0103	5.5E-08	2.1E-06	0107	3.2E-08	1.5E-06
21	0741	2.3E-08	9.9E-07	0744	1.1E-06	2.3E-06	0747	1.3E-08	9.7E-07
21	0829	7.9E-09	7.3E-07	0832	7.3E-08	1.3E-06	0844	1.8E-08	9.5E-07
21	1218	3.9E-10	6.4E-07	1221	1.4E-08	1.3E-06	1223	9.6E-10	5.3E-07
21	1306	1.5E-09	6.9E-07	1309	7.3E-08	1.4E-06	1312	4.2E-09	7.5E-07
21	1357	2.6E-09	8.0E-07	1405	9.0E-08	2.1E-06	1421	2.7E-08	1.4E-06
21	1544	2.2E-08	1.3E-06	1549	1.3E-06	1.5E-06	1655	9.3E-07	8.1E-06
21	1913	2.4E-08	1.0E-06	1916	8.2E-08	1.6E-06	1920	2.9E-08	1.1E-06
21	2308	1.1E-08	7.6E-07	2313	7.3E-08	1.9E-06	2321	3.7E-08	1.3E-06
22	0409	3.6E-08	1.3E-05	0420	3.3E-07	4.7E-06	0432	1.1E-07	2.9E-06
22	0833	6.0E-09	8.3E-07	0839	1.7E-07	2.5E-06	0842	3.5E-08	1.5E-06
22	1244	2.4E-10	6.2E-07	1243	4.4E-07	4.0E-06	1252	7.3E-08	2.2E-06
22	1605	3.9E-09	1.4E-05	1503	5.7E-06	2.6E-06	1510	3.7E-08	1.5E-06
23	0102	7.3E-09	6.4E-07	0105	8.7E-08	1.4E-06	0108	1.2E-08	8.2E-07
23	0447	3.7E-08	1.2E-06	0513	1.3E-07	4.3E-06	0519	6.1E-08	2.5E-06
23	0553	1.9E-08	1.7E-06	0559	1.2E-07	2.8E-06	0617	4.5E-08	2.2E-06
23	0710	3.1E-08	1.3E-05	0723	5.1E-07	7.2E-06	0742	1.4E-07	4.2E-06
23	0928	1.7E-08	8.6E-07	0933	7.4E-08	2.2E-06	0935	5.1E-08	1.4E-06
23	0947	1.2E-08	8.6E-07	0951	6.7E-08	1.4E-06	0953	2.4E-08	1.1E-06
23	1021	5.3E-08	1.3E-05	1109	1.2E-07	3.2E-06	1111	2.3E-08	1.6E-06
23	1451	1.3E-08	9.5E-07	1455	7.1E-08	1.5E-06	1458	2.0E-08	1.2E-06
23	1601	3.1E-09	7.4E-07	1607	4.1E-07	3.9E-06	1610	8.9E-08	2.1E-06
23	1626	5.4E-09	7.6E-07	1632	3.7E-08	1.3E-06	1641	1.3E-08	1.2E-06
23	1728	1.9E-08	1.1E-05	1733	7.5E-07	5.5E-06	1737	5.5E-08	2.5E-06
23	1843	2.9E-08	1.3E-05	1846	1.1E-07	2.1E-06	1849	4.3E-08	1.6E-06
23	2057	3.2E-08	1.1E-05	2102	2.5E-07	3.2E-06	2104	4.4E-08	1.5E-06
23	2137	1.3E-08	8.7E-07	2144	1.2E-07	2.2E-06	2149	4.1E-08	1.3E-06
23	2221	1.2E-08	8.0E-07	2235	1.3E-06	1.0E-05	2250	3.6E-07	5.7E-06
24	0005	6.9E-08	2.7E-06	0010	1.5E-06	9.9E-06	0012	1.0E-07	3.5E-06
24	0837	1.0E-08	8.9E-07	0914	2.0E-06	4.5E-06	0932	5.7E-08	2.7E-06
24	1835	1.1E-08	9.1E-07	1339	1.2E-07	2.0E-06	1343	1.7E-08	1.2E-06

SOLAR X-RAYS BY SATELLITE

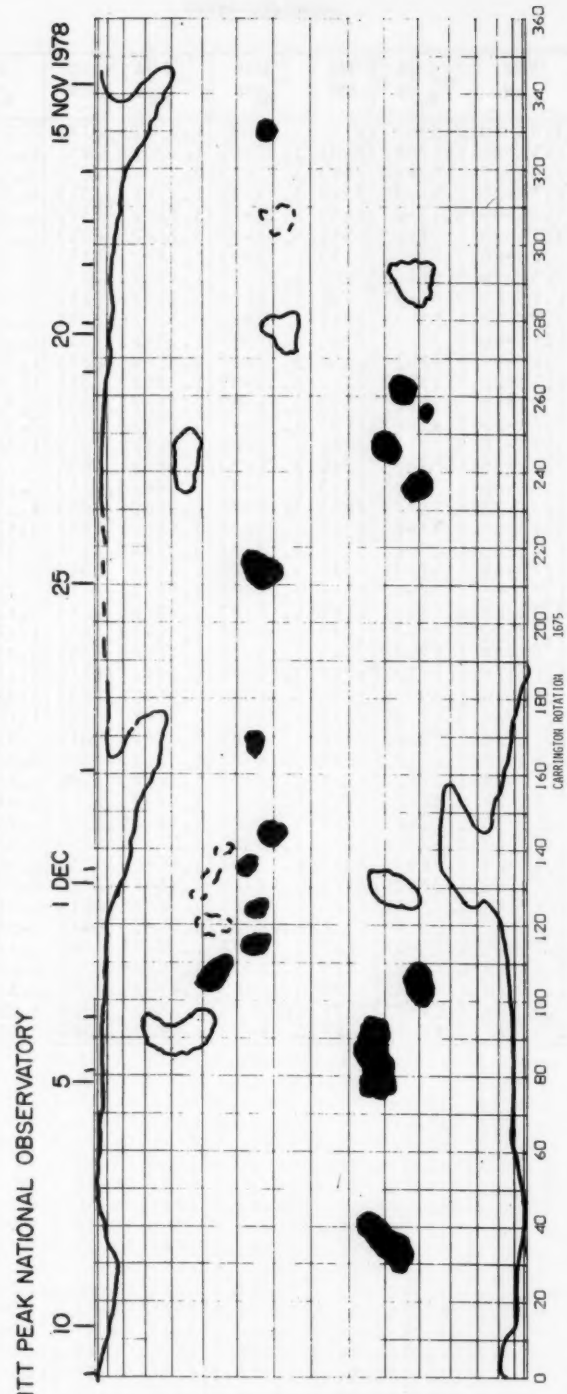
GOES

DECEMBER 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
24	2123	3.0E-09	9.3E-07	2126	5.9E-08	1.6E-05	2123	2.0E-08	1.2E-05
24	2218	1.4E-09	1.1E-05	2231	1.3E-05	1.5E-05	2241	4.3E-07	7.7E-05
25	0003	3.9E-09	2.8E-06	0008	3.3E-07	5.7E-05	0015	9.5E-08	3.7E-05
25	0307	2.0E-09	1.0E-06	0310	5.5E-08	1.7E-05	0315	4.3E-08	1.3E-05
25	0443	8.8E-09	8.1E-07	0452	2.3E-07	3.7E-05	0500	5.0E-08	2.1E-05
25	0559	3.1E-08	1.2E-05	0611	6.6E-05	3.0E-05	0617	4.9E-08	2.1E-05
25	1101	5.0E-09	7.2E-07	1105	2.2E-08	1.1E-05	1111	8.6E-09	9.0E-07
25	2019	7.5E-09	7.0E-07	2023	4.6E-08	1.1E-05	2032	1.7E-08	8.9E-07
25	2129	1.1E-08	8.6E-07	2132	1.1E-06	2.1E-05	2142	3.2E-09	1.4E-05
26	0033	3.2E-08	1.0E-05	0041	1.3E-05	2.3E-05	0044	2.6E-08	1.1E-05
26	2259	4.1E-09	6.0E-07	2302	6.5E-07	1.3E-05	2311	1.9E-08	9.5E-07
26	0536	3.4E-08	1.9E-05	0550	6.5E-07	8.4E-05	0605	1.7E-07	5.1E-06
26	2259	4.1E-09	6.0E-07	2302	6.5E-07	1.3E-05	2311	1.9E-08	9.5E-07
27	0548	2.9E-09	6.2E-07	0552	3.2E-08	1.9E-05	0557	8.3E-09	8.2E-07
27	0659	6.2E-09	7.4E-07	0703	1.6E-07	2.2E-05	0711	2.5E-08	1.1E-05
27	0857	3.7E-09	6.6E-07	0902	4.2E-08	1.2E-05	0912	1.3E-08	9.4E-07
27	1625	3.8E-09	1.9E-05	1640	2.2E-05	1.0E-04	1651	5.7E-06	5.3E-05
27	2310	2.9E-08	1.5E-05	2313	2.3E-05	3.4E-05	2313	2.2E-08	1.5E-05
28	0044	1.5E-08	1.2E-05	0053	3.5E-08	1.9E-05	0059	2.5E-08	1.5E-05
28	0738	5.1E-08	1.3E-05	0741	2.2E-07	3.4E-05	0747	6.4E-08	2.5E-06
28	1148	1.6E-08	1.2E-05	1154	3.1E-07	3.8E-06	1157	9.5E-09	2.5E-06
28	2338	2.7E-08	1.3E-05	2341	9.0E-05	2.6E-05	2343	2.3E-08	1.9E-06
29	0307	1.7E-08	1.3E-05	0310	3.1E-08	2.5E-05	0314	2.0E-08	1.7E-06
29	1141	5.2E-09	9.1E-07	1144	1.1E-07	2.3E-05	1148	3.7E-08	1.5E-05
29	1433	4.7E-09	3.7E-07	1443	6.5E-05	1.5E-06	1451	1.2E-08	1.1E-05
29	1640	1.8E-08	1.1E-05	1643	4.1E-08	2.1E-05	1655	2.3E-08	1.5E-05
29	1707	2.1E-08	1.2E-05	1712	3.2E-08	1.8E-05	1715	3.1E-08	1.4E-05
29	1749	1.5E-08	1.3E-06	1752	2.2E-08	1.9E-05	1755	2.3E-08	1.3E-06
30	0326	8.3E-09	9.1E-07	0342	8.2E-08	2.3E-05	0421	1.0E-08	1.5E-05
30	0537	1.7E-08	1.2E-05	0510	1.3E-05	7.0E-05	0612	2.9E-06	2.9E-05
30	0851	2.8E-08	2.2E-06	0854	1.7E-07	5.6E-05	0855	5.9E-08	2.5E-05
30	1048	1.1E-08	1.7E-05	1101	4.2E-08	3.3E-05	1104	2.0E-08	2.2E-05
30	1608	2.0E-08	1.4E-06	1613	1.5E-07	3.1E-05	1613	3.0E-08	2.2E-05
30	2247	1.1E-08	1.1E-05	2310	5.1E-07	5.3E-05	2321	1.2E-07	3.6E-06
30	2349	1.7E-08	1.3E-05	2354	9.9E-08	2.1E-05	2359	2.3E-08	1.5E-06
31	0307	2.4E-08	1.2E-05	0317	4.3E-07	5.4E-05	0334	1.4E-07	3.3E-05
31	0718	1.3E-08	1.3E-05	0721	3.5E-08	2.4E-05	0723	2.7E-08	1.5E-05
31	0755	1.4E-08	1.2E-05	0805	1.0E-07	2.8E-05	0814	1.9E-08	1.9E-05
31	0905	1.5E-08	1.2E-06	0910	9.4E-08	2.5E-05	0913	1.5E-05	1.9E-06
31	1039	1.7E-08	1.4E-05	1043	2.5E-08	4.5E-05	1045	1.4E-08	1.3E-06
31	1507	2.5E-08	1.4E-05	1515	5.1E-07	5.7E-06	1525	1.0E-07	3.4E-05
31	1725	1.7E-08	1.2E-05	1728	3.7E-08	1.8E-05	1735	2.3E-08	1.5E-06
31	1758	1.5E-08	1.2E-05	1801	7.0E-05	1.9E-05	1804	2.0E-08	1.3E-05
31	1903	3.3E-08	1.4E-05	1907	5.9E-08	2.2E-05	1909	2.5E-08	1.5E-05

HELIUM 10830Å SYNOPTIC MAPS

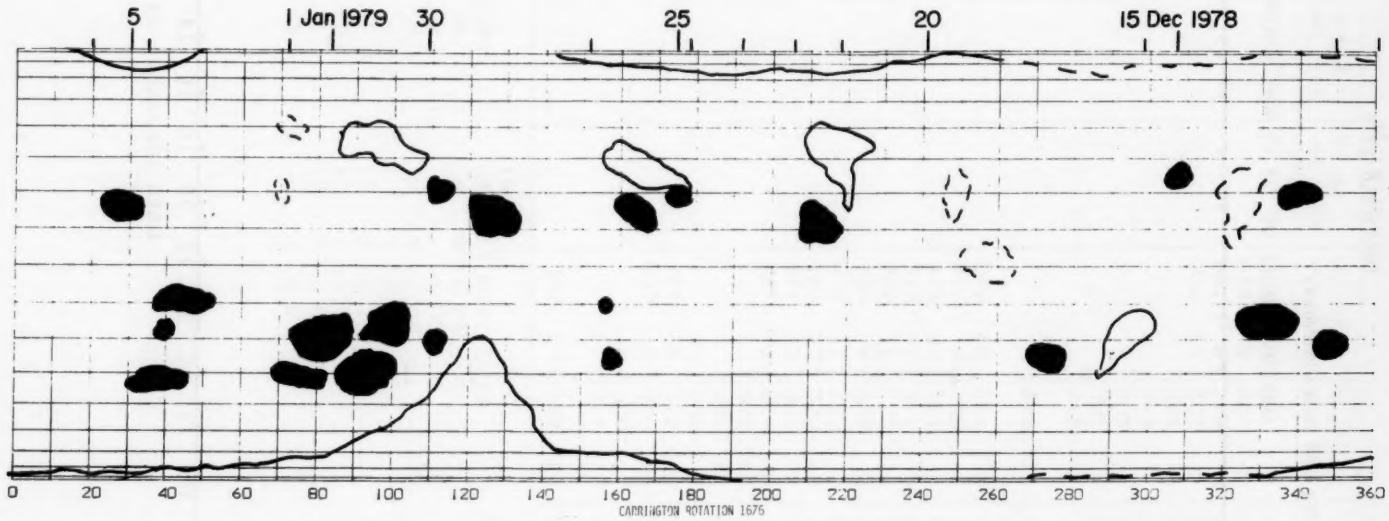
CARRINGTON ROTATION 1675



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1676

KITT PEAK NATIONAL OBSERVATORY

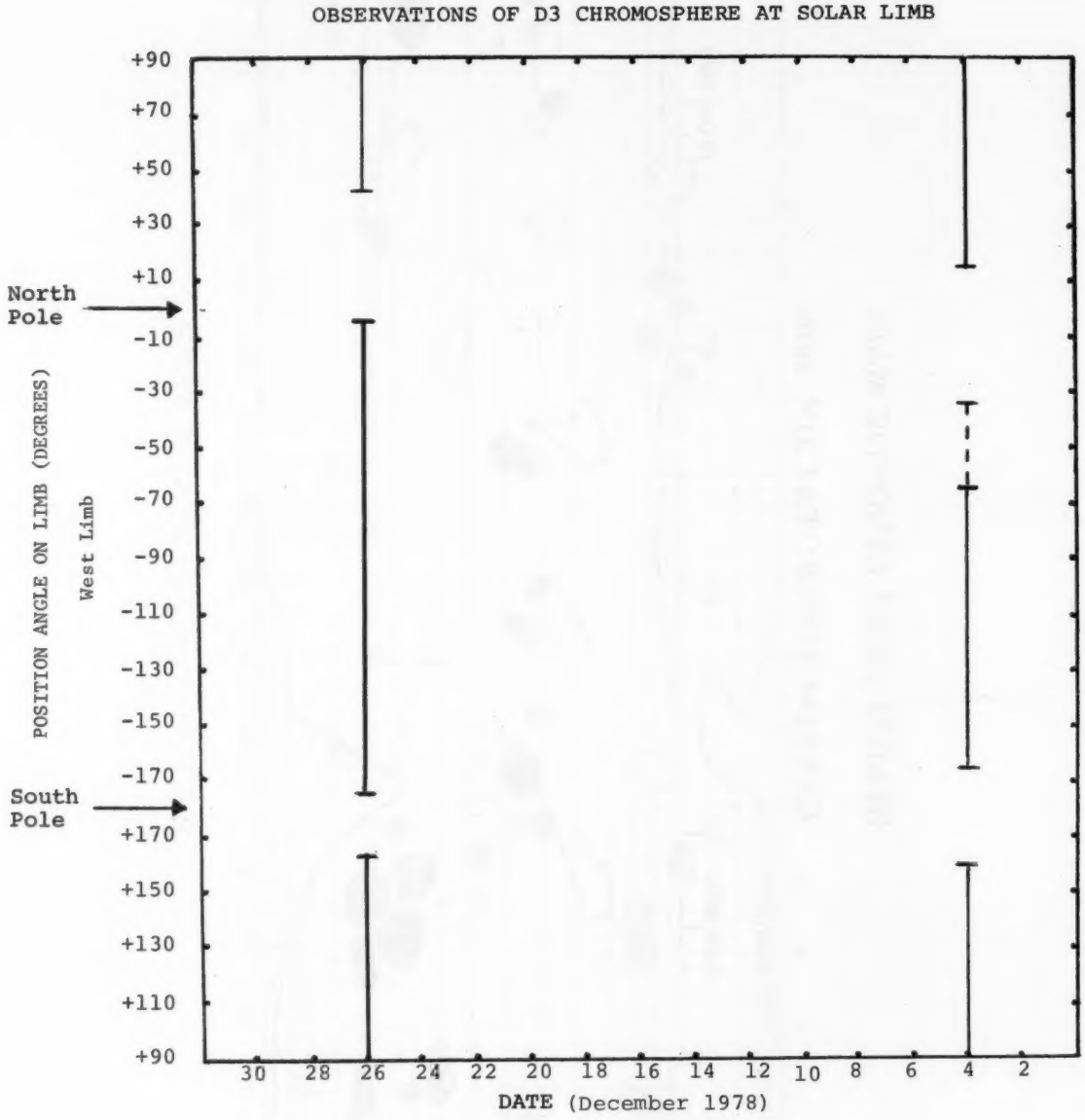


CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

DECEMBER 1978

Big Bear Solar Observatory



SOLAR WIND

Interplanetary Scintillations

DECEMBER 1978

DAY	3C48 VEL	3C48 ERR	3C144 VEL	3C144 ERR	3C147 VEL	3C147 ERR	3C161 VEL	3C161 ERR	3C237 VEL	3C237 ERR	3C273 VEL	3C273 ERR	3C298 VEL	3C298 ERR	3C459 VEL	3C459 ERR
1	546	56							204	20	276	3	312	4	479	6
2	498	21							274	5	250	3	299	4	434	4
3	509	54							281	8	244	3	286	3	401	26
4	422	29							226	15	285	2	281	3		
5	313	3									320	5	305	3	461	30
6											363	4	306	4	493	56
7	360	33									335	5	312	9		
8											304	6	318	5		
9											314	21				
10															238	44
11											272	27	311	3	302	50
12													318	16	365	9
13	407	7							222	20	261	3	378	3	435	13
14	355	7							395	3	353	3	397	7	594	6
15	431	9							449	31	311	4	423	4	456	15
16									377	11	372	5	322	3	623	10
17	394	5							362	11	298	4	315	3		
18	422	14							350	4	327	3	385	4		
19	456	30							398	11	343	7	313	4		
20	309	18							563	53	330	27	365	4		
21	446	69							391	73	324	27	386	8		
22									367	6	289	40	366	9	694	13
23											494	40	377	12	518	37
24	382	46									391	47	350	7	628	22
25	436	21									351	7	332	3	670	15
26	532	15							402	6	313	6	310	2		
27	417	47							233	8	320	4	358	12		
28	533	18									273	3	353	11	600	130
29	543	4									316	3	317	3		
30	520	25														
31									347	89	394	24	296	13		

DECEMBER 5	UT	LAT	DIST	DLON	15	UT	LAT	DIST	DLON	25	UT	LAT	DIST	DLON
3C48	5.	6.	1.23	-8.		4.	5.	1.21	-9.		4.	4.	1.17	-11.
3C144	9.	0.	1.30	2.		8.	-1.	1.30	-0.		7.	-2.	1.30	-2.
3C147	8.	5.	1.27	3.		7.	4.	1.28	1.		7.	3.	1.27	-1.
3C161	10.	-7.	1.25	4.		10.	-7.	1.26	2.		9.	-8.	1.27	-0.
3C237	14.	-2.	1.11	15.		13.	-3.	1.15	14.		12.	-4.	1.19	12.
3C273	16.	0.	0.93	22.		15.	-1.	0.98	17.		14.	-2.	1.03	17.
3C298	18.	13.	0.73	41.		17.	7.	0.83	33.		16.	3.	0.91	24.
3C459	2.	4.	1.08	-15.		2.	3.	1.03	-16.		1.	2.	0.98	-17.

INFERRED IP MAGNETIC FIELD

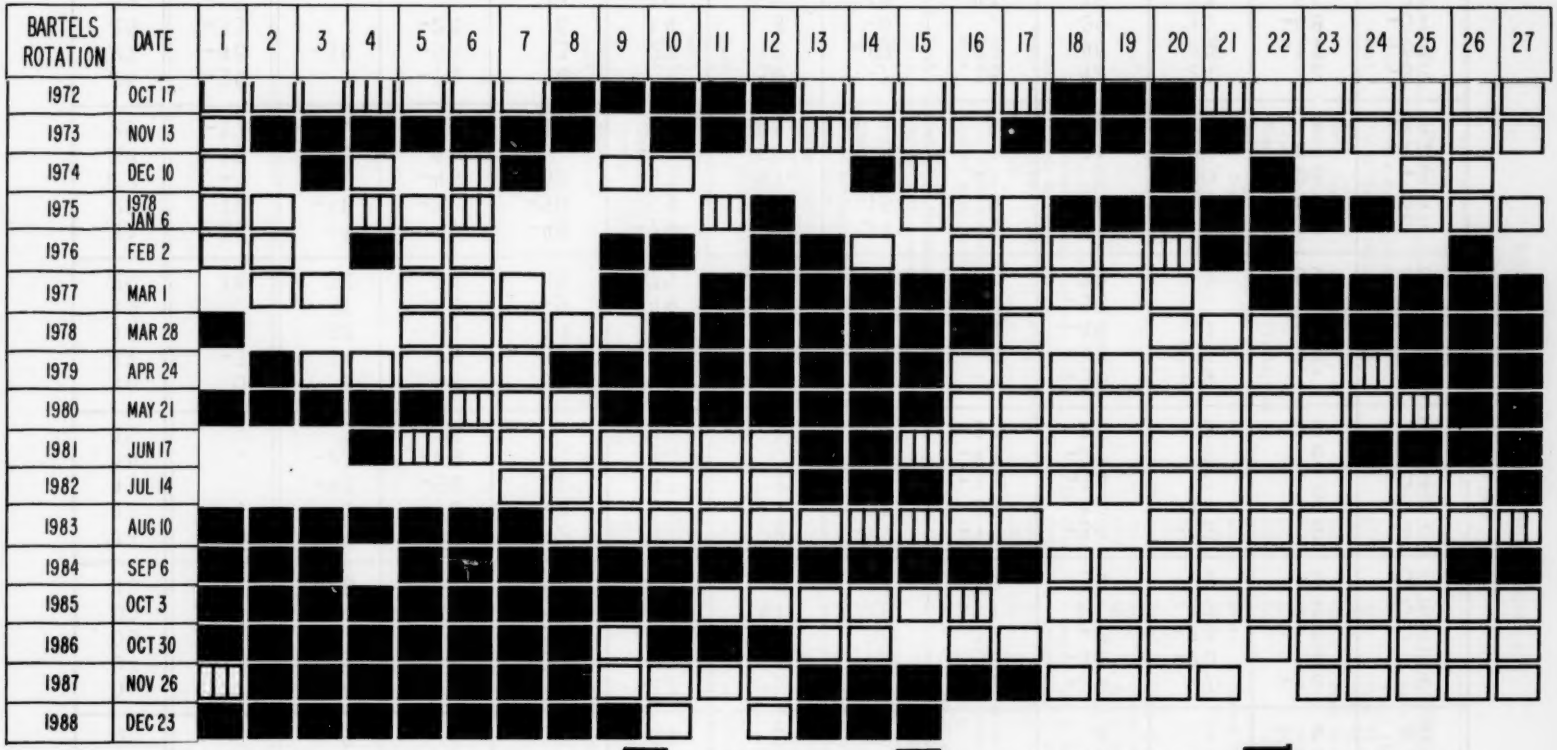
BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1972	OCT 22					-	AT														AT	AT				*		
1973	NOV 18			TA	AT						-		AT							*				*		*		
1974	DEC 15				-	-	-		AT	-		AT			AT	AT		AT		TA		TA		TA		*		
1975	1978 JAN 11		*	*					*		*	*						*			TA		-	AT		-		-
1976	FEB 7						*	TA				-			-	-						-		*	TA	A*	TA	
1977	MAR 6	TA			-				AT			T*	*					TA			AT	AT		AT	AT	*	TA		
1978	APR 2							*	-		AT											AT	AT					
1979	APR 29		TA		*		TA	AT	AT	TA		-	T*							TA	TA			AT				
1980	MAY 26				TA		AT	AT				-				AT	TA					-				-	-	-
1981	JUN 22	TA					A*					-	TA	TA	TA		AT			*					*	AT	AT	-		AT		
1982	JUL 19									TA							-	-		TA					AT	AT	*		TA		
1983	AUG 15					TA			AT		AT	AT			AT	TA						A*						TA	
1984	SEP 11			TA		AT				TA	T*						A*			—					—		A*	TA	-	
1985	OCT 8		*	TA			AT				-	-	-						TA	TA	-		AT			-				
1986	NOV 4			-			-	AT	-		-	-						*	AT		-		AT	AT	AT	AT				
1987	DEC 1	AT	AT		-						-	TA		-	-	AT	-	-	AT	-	TA	-	-	A*	-			*		-	AT	-		-	
1988	DEC 28		-	-	-																													

= definitely towards the sun = definitely away from the sun

T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

STANFORD MEAN SOLAR MAGNETIC FIELD



POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT ≤FIELD ≤2μT, ■ = FIELD <-2μT

No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT. Dates given are not Bartels Rotation dates. These earlier dates correspond to the occurrence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

1978

DAY	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
01	.	16	.	52	-12	-28	1	40	26	-11	-18	-72
02	.	31	22	46	-34	-22	13	39	32	-20	-21	-39
03	14	26	12	43	-27	-12	15	42	15	-14	-36	-7
04	31	.	.	13	-27	-5	18	39	18	-8	-28	17
05	.	-5	8	4	-29	6	24	31	2	-3	-19	19
06	27	4	11	-15	-27	5	43	29	-24	-7	-12	9
07	15	9	4	-32	-23	21	42	30	-12	-20	3	5
08	.	.	.	-53	-12	33	36	17	-7	-29	-6	-15
09	-1	.	-31	-52	3	41	16	-11	.	-37	-17	-26
10	11	-28	.	-41	24	40	-11	-10	-35	-29	-3	-37
11	0	-43	-70	-32	41	23	-17	-15	-34	-32	5	-19
12	.	.	-78	-4	50	12	-12	-22	-42	-14	9	-16
13	.	-41	-56	22	47	8	-38	-33	-36	2	.	13
14	.	-23	-49	.	30	0	.	-43	-27	7	16	31
15	.	3	-28	.	16	-24	.	-31	-26	8	20	43
16	0	.	-3	58	5	-38	.	-9	-36	9	.	65
17	-3	31	18	37	1	.	.	5	-48	5	34	.
18	.	22	54	11	-29	.	.	13	-44	-1	42	59
19	.	37	48	-9	-49	.	.	7	-50	.	.	30
20	18	22	24	-30	-75	-16	23	7	-33	4	55	18
21	39	-1	.	-49	-79	0	21	5	-21	3	35	32
22	10	-18	-23	-50	-59	24	16	4	-14	19	40	27
23	-4	-49	-49	-62	-37	51	6	-1	5	20	28	-3
24	-15	.	-69	.	-21	52	3	1	31	25	27	-20
25	-17	.	-79	-13	-9	48	3	5	43	23	18	-26
26	-36	.	-73	10	1	30	-7	18	42	24	2	-32
27	-48	-34	-53	13	27	12	-13	.	40	29	-17	-63
28	-33	.	-28	6	14	3	-6	.	29	30	-48	-51
29	-15		.	13	-10	-5	14	41	15	17	-61	-36
30	14		.	18	-20	-10	27	41	2	-3	-65	-22
31	10		.		-27		33	35		-16		-21

Dot symbol entry indicates no data available for the day.

BOULDER GEOMAGNETIC SUBSTORM LOG

DECEMBER 1978

DATE	ONSET TIME	DIR	COMMENTS
01	0805	≈ center	Moderate SS
	1020	West	1st of double onset SS
	1100	West	2nd of double onset SS, moderate
02			Quiet day
03			Quiet day
04	0740	West	Weak SS
	1100	West	
	1610		Slow onset SS
05			Minor perturbations, no distinctive SS
06			Quiet day
07			Quiet day
08	1045	West	Weak SS
09			Quiet day
10	0935		Weak SS, Sachs Harbour to Inuvik; otherwise quiet day
11			Quiet day
12	1015	West	Weak SS
	1310		Weak SS, slow onset
13			0140-0800 UT, unsettled period no distinctive SS onset
14	0128		SSC-brief Magstorm through 1500 UT.
15	0350	≈ center	Strong Substorm near Boulder
	0750	West	Centered between Fort Smith and Fort Simpson
	0850	West	
	1115	West	1st of double onset
	1155	West	2nd of double onset
	1445		
16	0335	East	1st of double onset
	0410	East	2nd of double onset
	0845	West	
	0955	West	
	1700		Slow onset
17			Minor perturbations, no significant SS activity
18	0450		Sharp negative impulse H-Component all mid and low latitude stations
	0720	≈ center	Strong SS, beginning of Magstorm conditions lasting through 2100 UT.
	1145		Very strong SS
19	0350	East	
	0500	East	
	0850	West	
	1305	West	Very strong SS
20	0125	East	
	0425		Beginning of Magstorm conditions lasting through 1700 UT.
	0900	West	Strong SS
	1145	West	Strong SS
	1400		
21	0315	East	Weak SS, beginning of unsettled conditions lasting through 1400 UT.
	0715	West	Weak SS
	0940	West	Weak SS
	1125	West	Weak SS
22	0230	East	
	0340	East	
	0400	East	
	0420	East	
	0835	West	
	1100	West	Strong SS
	1155	West	
	1250	West	
	1440		
	1530		
23	0120	East	Weak SS
	0655	West	1st of double onset
	0730	West	2nd of double onset
24	0545	≈ center	Weak SS
	1050	West	
25	0735	≈ center	1st of multiple onset
	0805	≈ center	2nd of multiple onset
	0840	West	3rd of multiple onset
	1055	West	
	1210		Positive impulse H-Component low latitude stations
	1245	West	1st of multiple onset
	1325	West	2nd of multiple onset
	1400	West	3rd of multiple onset
26			0700-1700 UT, unsettled field
	0730	≈ center	
27	0425	East	
	1240	West	1st of double onset
	1310	West	2nd of double onset
28	0315	East	
	1550		Slow onset
	1725		Slow onset
29	1630		Strong SS
30			Field disturbed throughout day
	0250		Strong negative H-Component excursion at mid and low latitude stations. Auroral stations quiet.
	0345	East	
	0425	East	
	1005	West	
	1200	West	
	1300	West	
	1450		
	1825		Slow onset
31			No data-computer malfunction

SGD 413 Part I (Prompt)

NOVEMBER 1978 DATA

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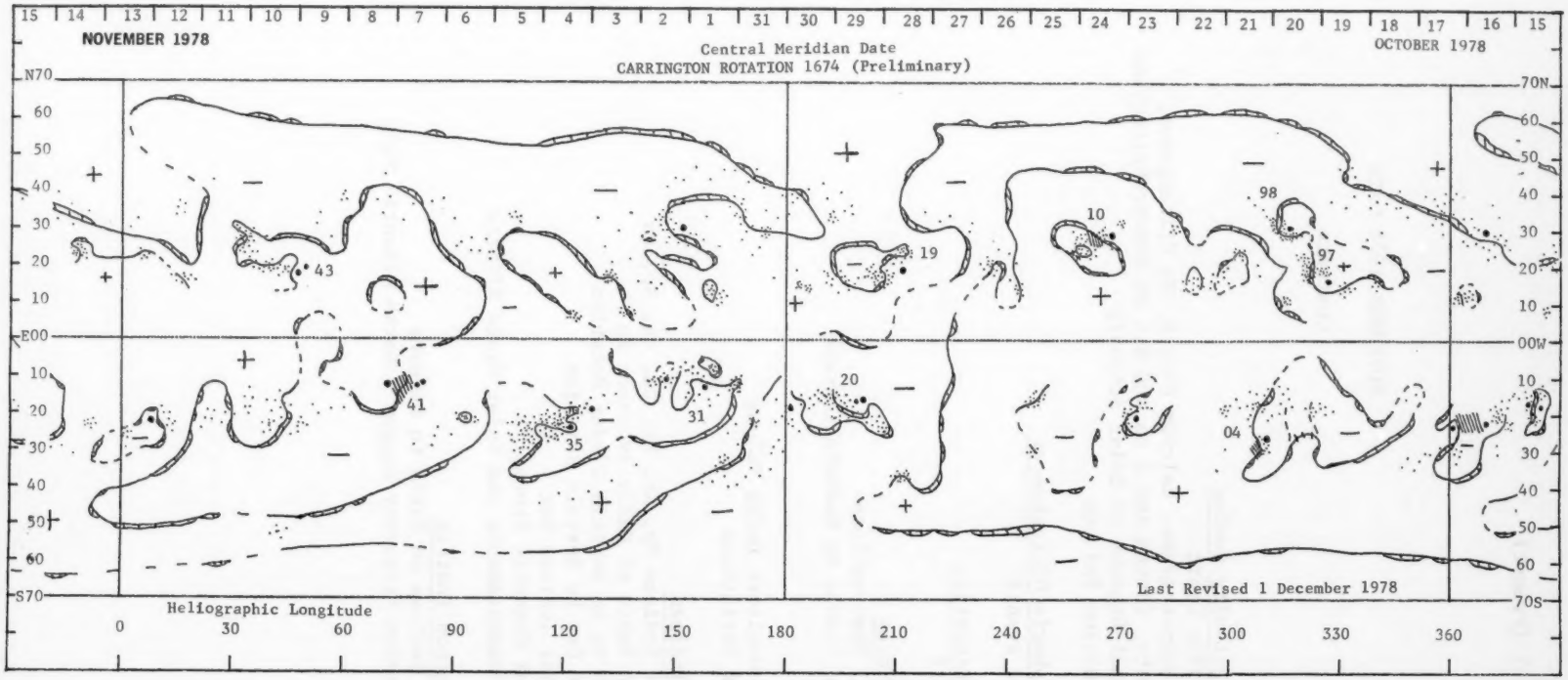
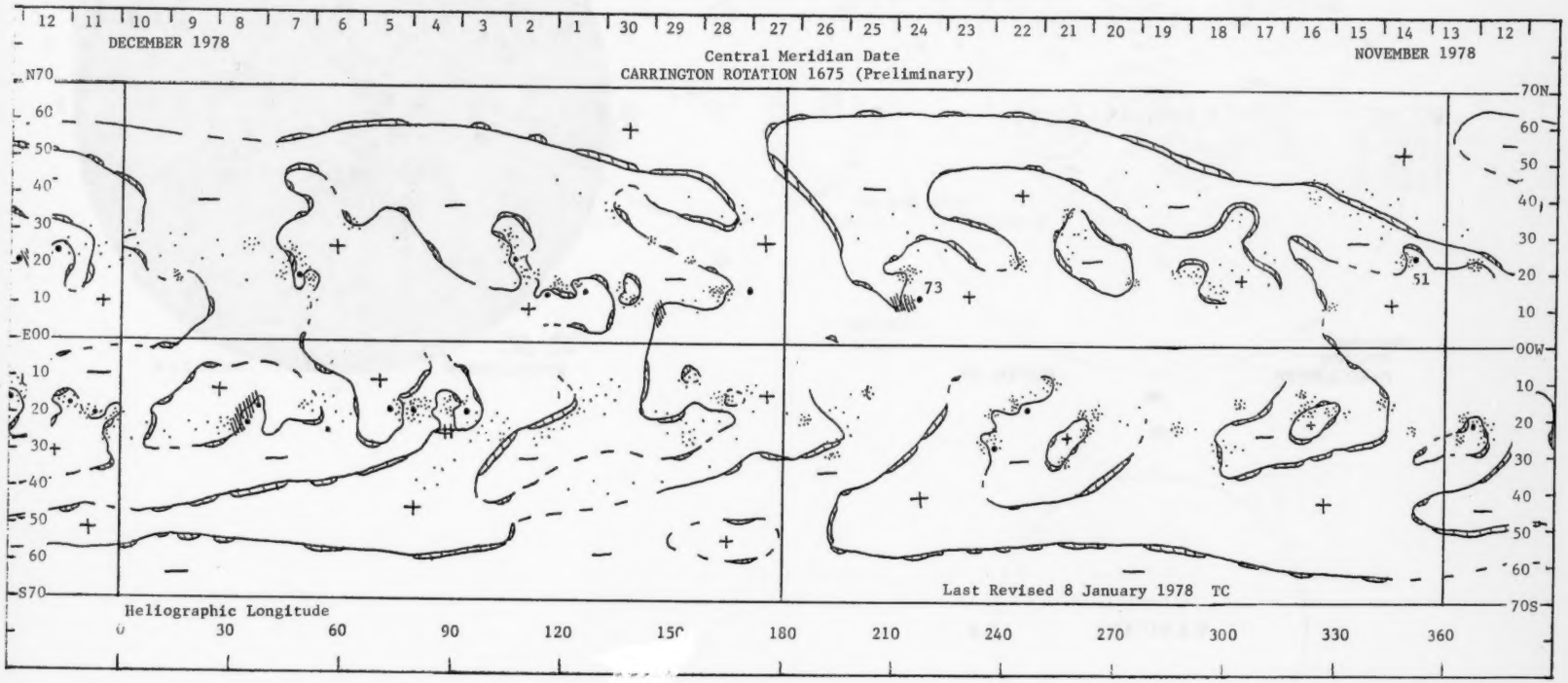
Hα SYNOPTIC CHART

CARRINGTON ROTATION 1674 (PRELIMINARY)



Hα SYNOPTIC CHART

CARRINGTON ROTATION 1675 (PRELIMINARY)



NOVEMBER 1, 1978 (P = 24.59, B_o = 4.38, L_o = 166.65)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

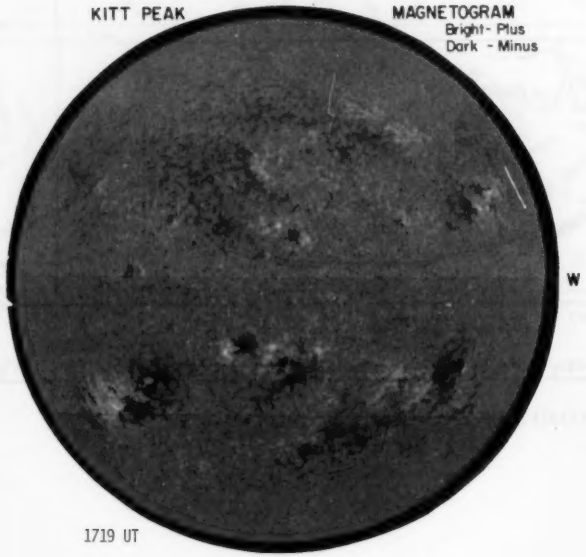
E — NO DATA — W

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus



E W

1719 UT

Sp

MT. WILSON

Np

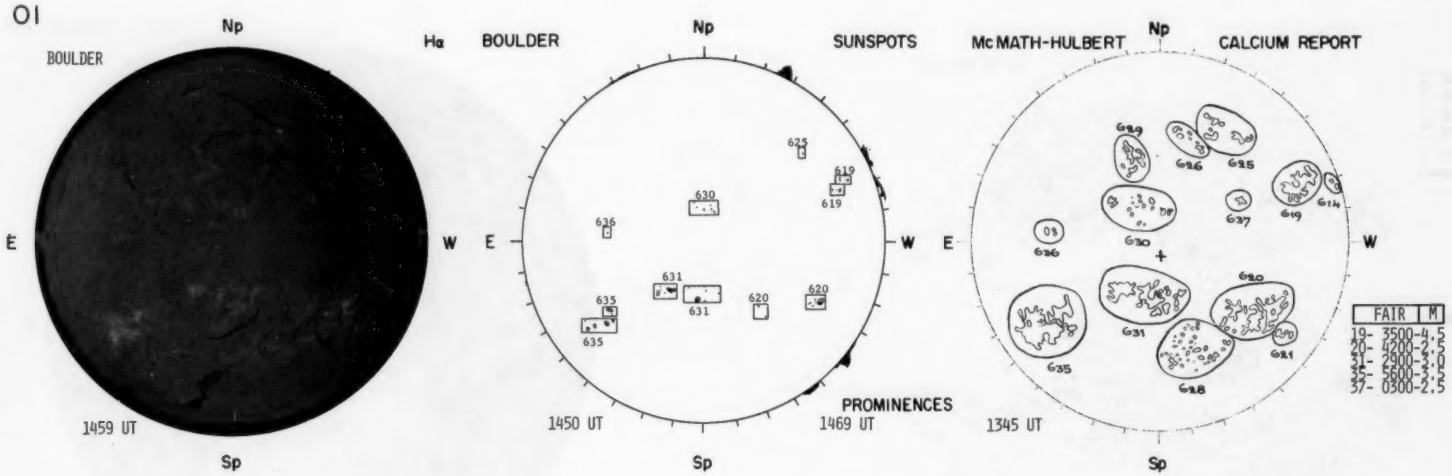
MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

E — NO DATA — W

Sp

Levels
± 5
± 10
± 20
± 40
± 80


O1
BOULDER
Np
Hα
E
W
Sp
1459 UT
BOULDER
SUNSPOTS
PROMINENCES
1450 UT
1469 UT
McMATH-HULBERT
CALCIUM REPORT
1345 UT
FAIR | M
19- 3500-4.5
20- 4200-2.5
31- 2900-3.0
35- 5600-3.5
37- 0300-2.5

NOVEMBER 2, 1978 (P = 24.43, B_o = 4.28, L_o = 153.46)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

E — NO DATA — W

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus

E

W

1710 UT

Sp

MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5

E

W

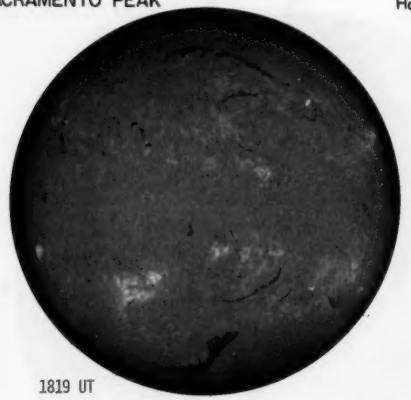
Levels
± 5
± 10
± 20
± 40
± 80

17.44-18.89 UT

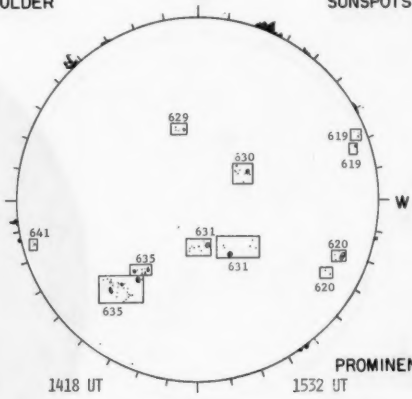
Sp

02

SACRAMENTO PEAK Np Hα

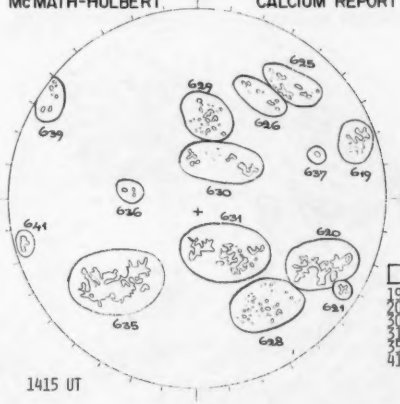


BOULDER Np SUNSPOTS



PROMINENCES

McMATH-HULBERT Np CALCIUM REPORT

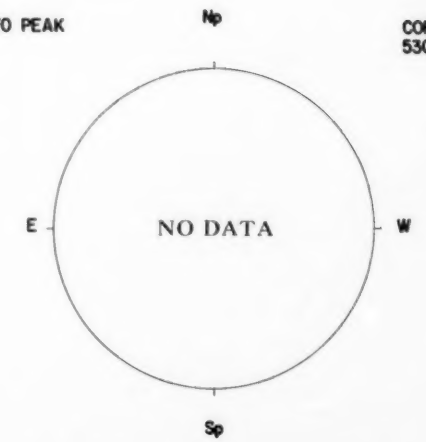


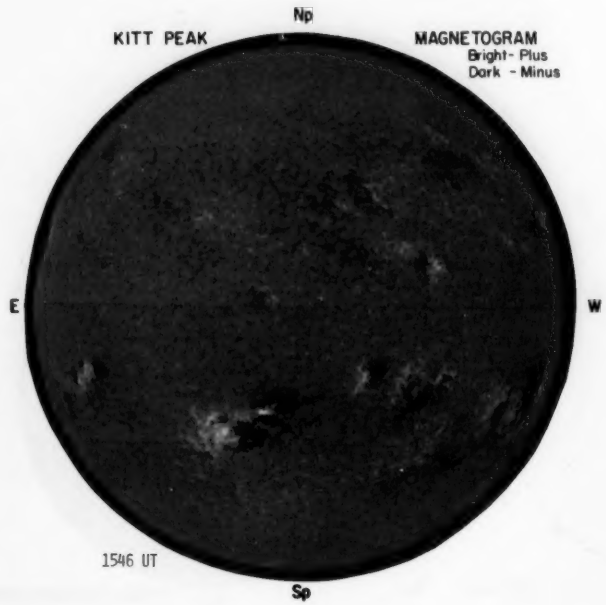
FAIR	M
19- 3000	3.5
20- 3800	2.5
30- 1400	3.0
31- 2500	2.5
35- 6000	4.0
41- 0900	3.5

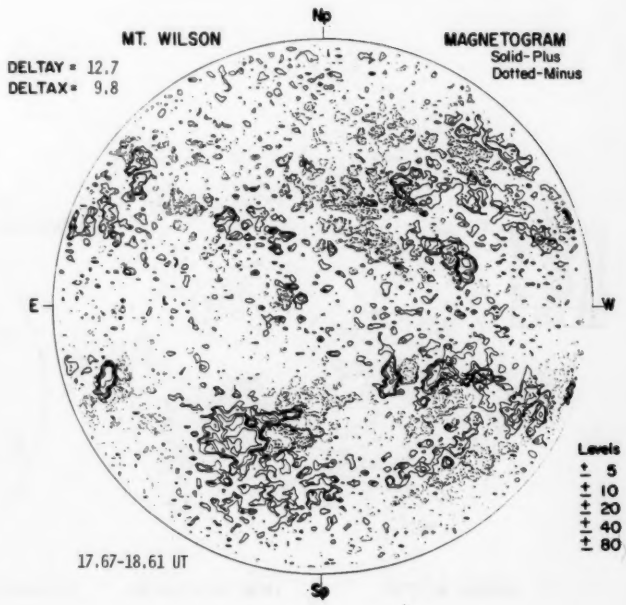
NOVEMBER 3, 1978 (P = 24.25, B_o = 4.18, L_o = 140.28)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

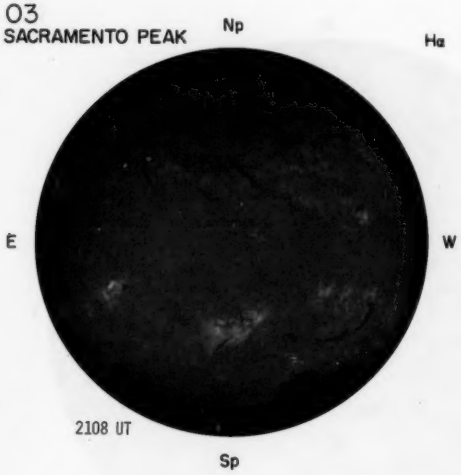




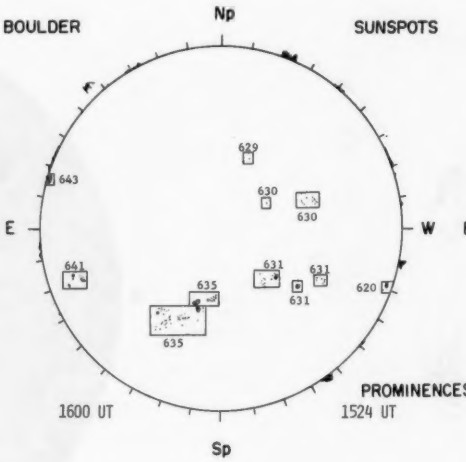


03

SACRAMENTO PEAK



Hα BOULDER



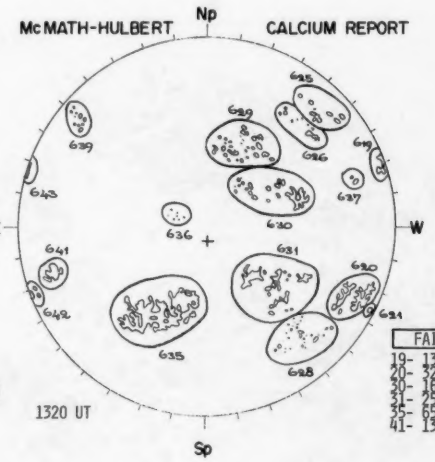
SUNSPOTS

PROMINENCES

1524 UT

McMATH-HULBERT

CALCIUM REPORT

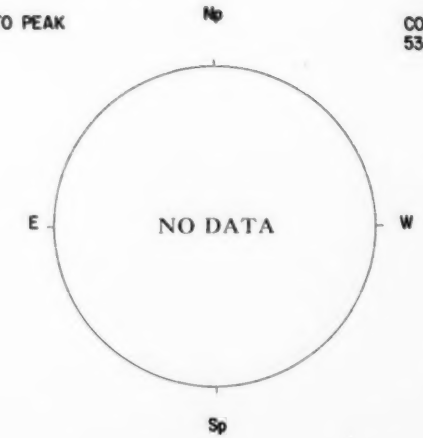


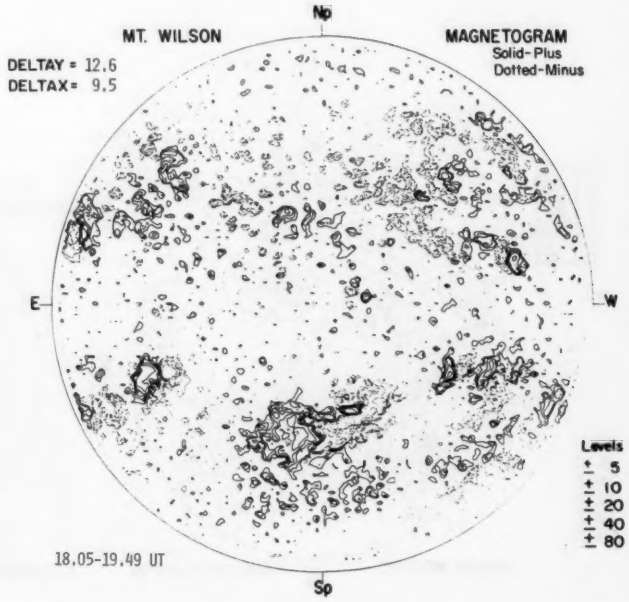
FAIR	D
19- 1300	3.0
20- 3200	2.5
30- 1600	3.0
31- 9200	3.0
35- 6300	3.5
41- 1300	3.5

NOVEMBER 4, 1978 (P = 24.07, B_o = 4.07, L_o = 127.09)

SACRAMENTO PEAK

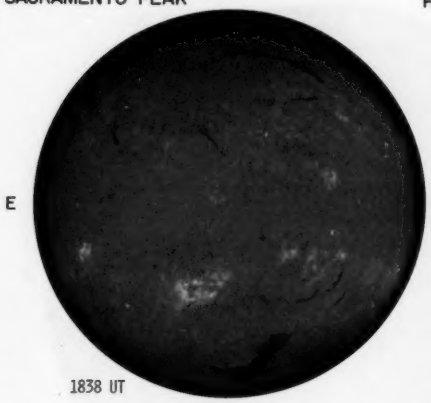
CORONA (1.15 $R_\odot$)
5303 Å





04

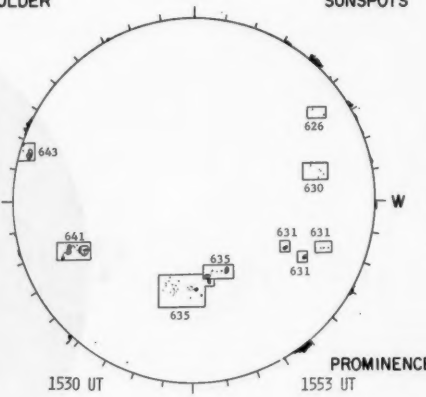
SACRAMENTO PEAK Np



E W

1838 UT Sp

Hα BOULDER Np SUNSPOTS

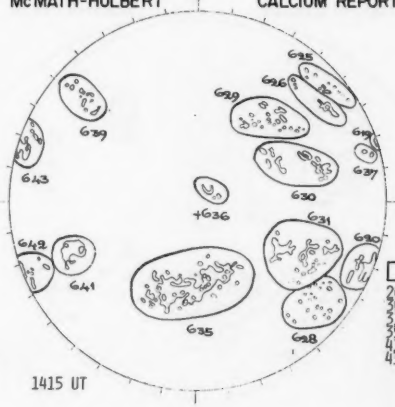


E W

1530 UT Sp 1553 UT

PROMINENCES

McMATH-HULBERT Np CALCIUM REPORT



E W

1415 UT Sp

FAIR	S
20- 3000	2.0
30- 1600	3.0
31- 2500	3.0
35- 6500	3.0
41- 3000	3.5
43- 3000	3.5

NOVEMBER 5, 1978 (P = 23.87, B_0 = 3.97, L_0 = 113.91)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

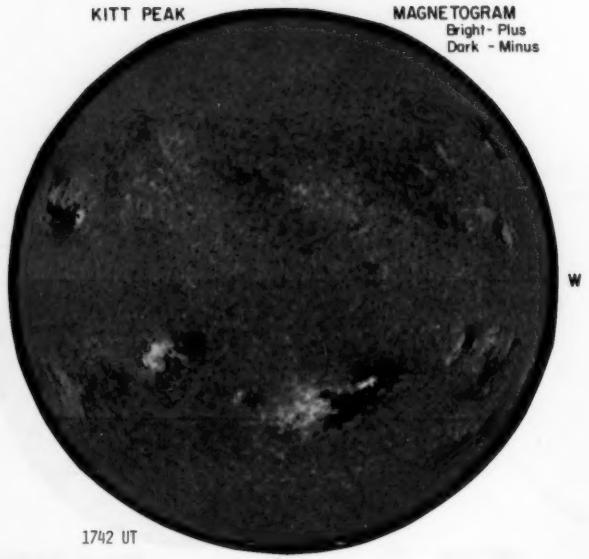
E — NO DATA — W

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus



E W

1742 UT

Sp

MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

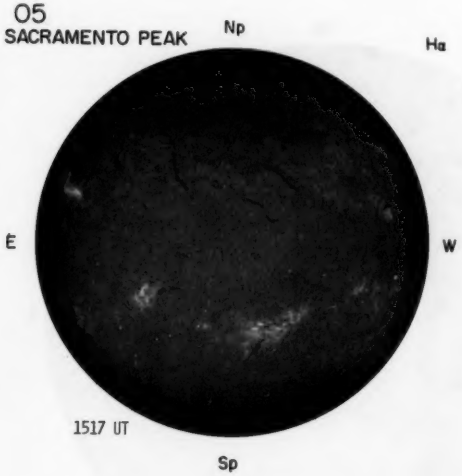
E — NO DATA — W

Levels
± 5
± 10
± 20
± 40
± 80

Sp

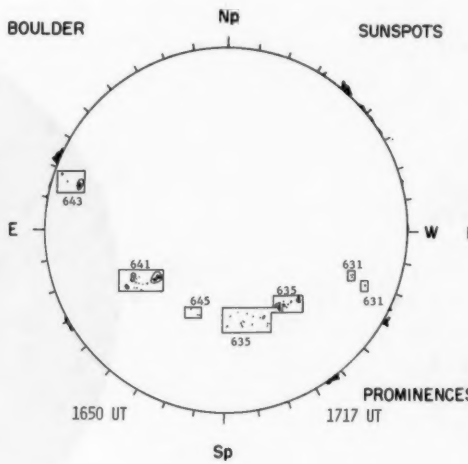
05

SACRAMENTO PEAK



1517 UT

Hα BOULDER



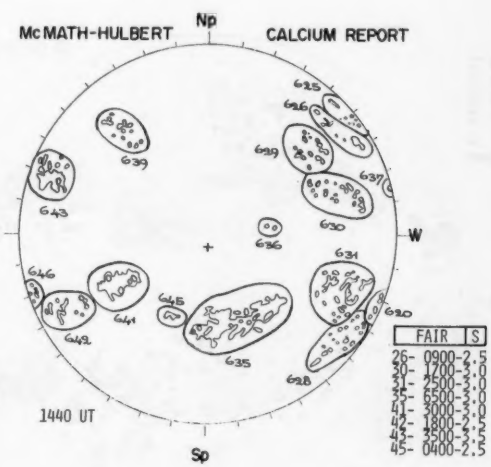
1650 UT

SUNSPOTS

PROMINENCES

1717 UT

McMATH-HULBERT



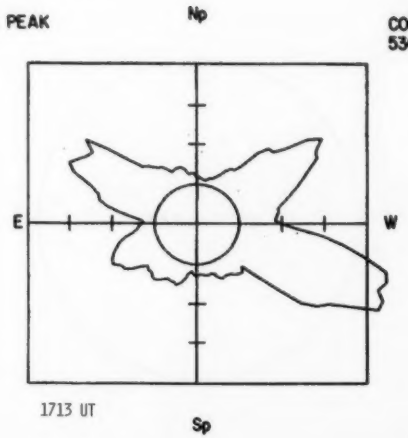
1440 UT

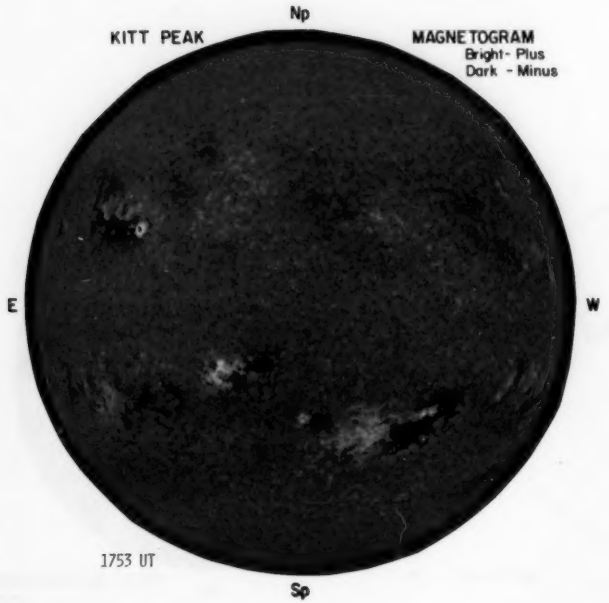
CALCIUM REPORT

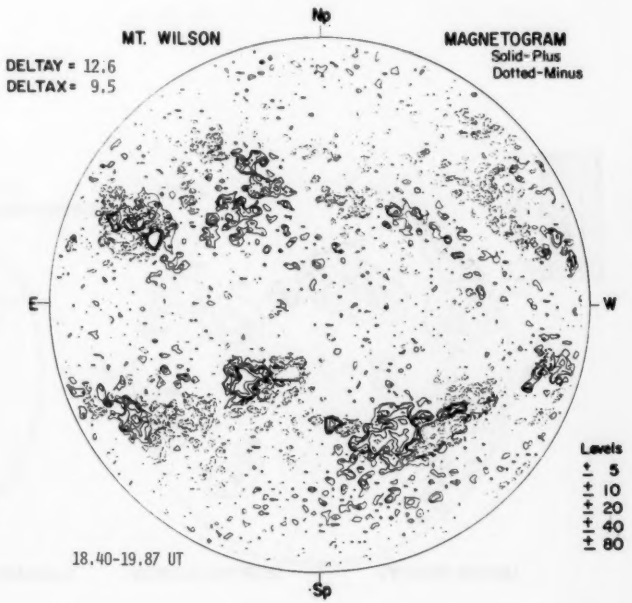
	FAIR	S
26-	0900	2.5
30-	1700	3.0
31-	2500	3.0
35-	2500	3.0
41-	3000	3.0
42-	1800	2.5
43-	3500	3.5
45-	0400	2.5

NOVEMBER 6, 1978 (P = 23.67, B_o = 3.86, L_o = 100.72)

SACRAMENTO PEAK

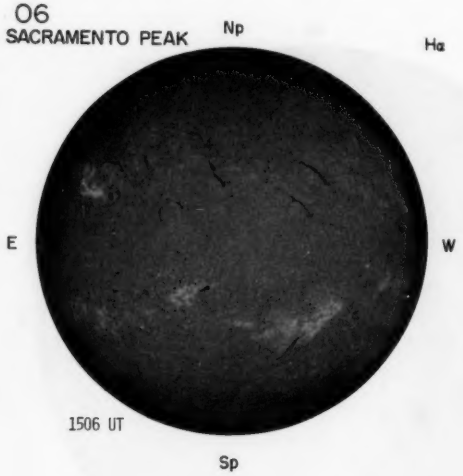




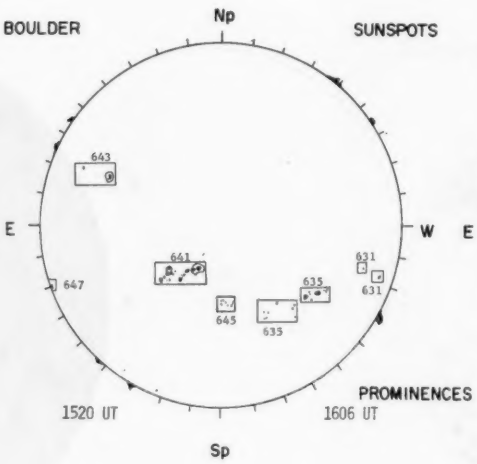


06

SACRAMENTO PEAK



Hα BOULDER



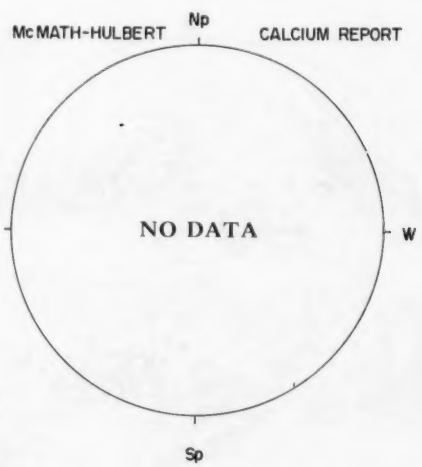
SUNSPOTS

PROMINENCES

1606 UT

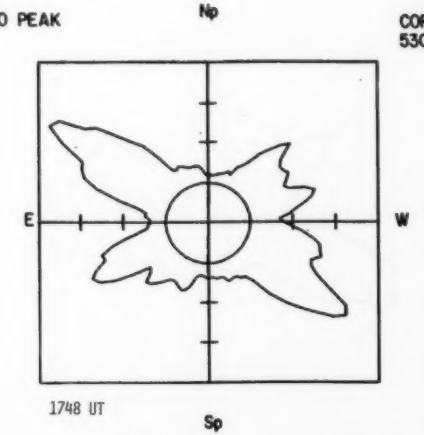
McMATH-HULBERT

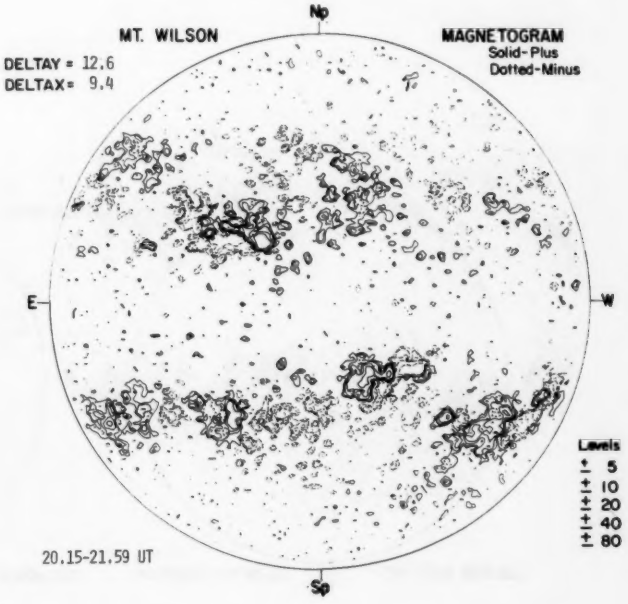
CALCIUM REPORT



NOVEMBER 8, 1978 (P = 23.25, B_0 = 3.64, L_0 = 74.35)

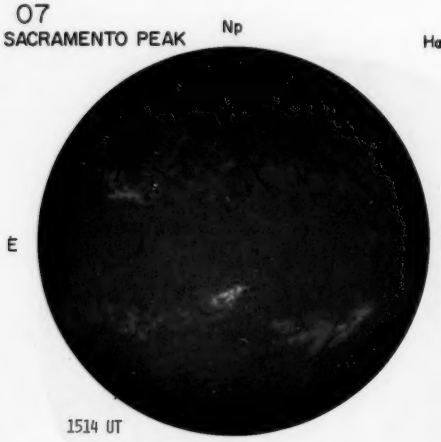
SACRAMENTO PEAK



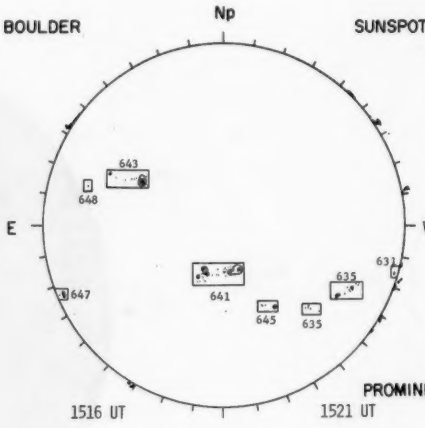


07

SACRAMENTO PEAK



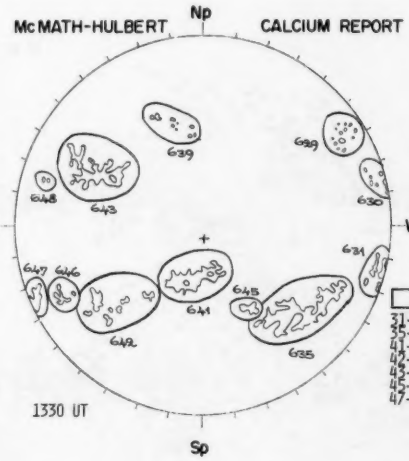
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT



CALCIUM REPORT

	POOR	D
31-	2300-	2.5
1-	0600-	3.0
1-	1400-	3.0
2-	1900-	2.5
3-	0500-	3.0
3-	1200-	3.0
7-	2500-	2.5

NOVEMBER 7, 1978 (P = 23.47, B_o = 3.75, L_o = 87.54)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

E

W

1741 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright- Plus
Dark - Minus

E

W

1624 UT

Sp

MT. WILSON

Np

DELTAY = 12.6
DELTAX = 9.5

MAGNETOGRAM
Solid-Plus
Dotted-Minus

E

W

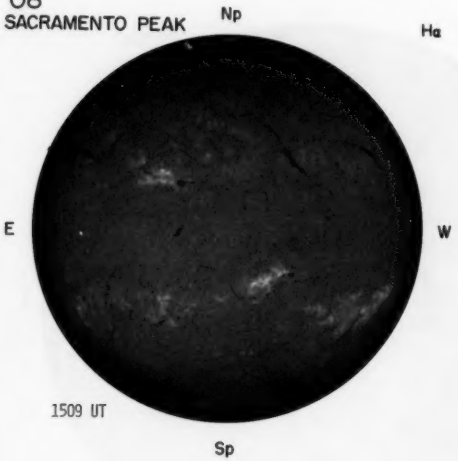
Levels
± 5
± 10
± 20
± 40
± 80

17.95-19.38 UT

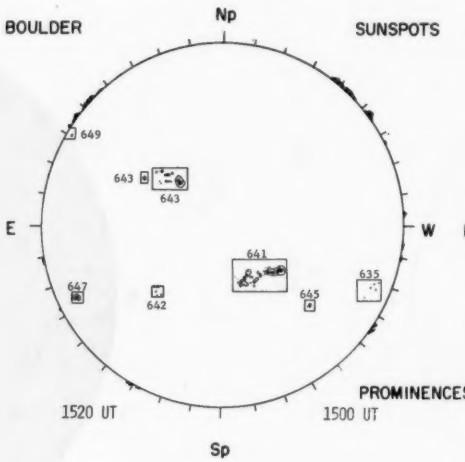
Sp

08

SACRAMENTO PEAK



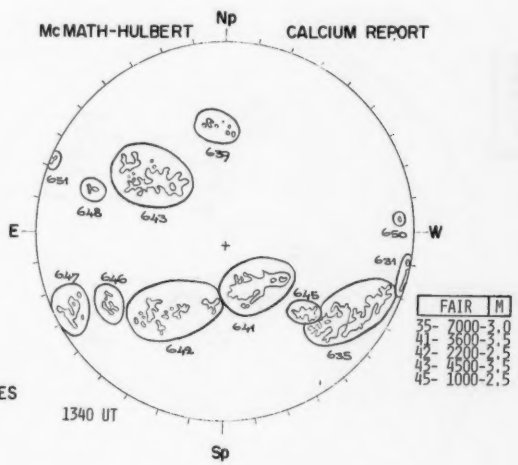
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT CALCIUM REPORT



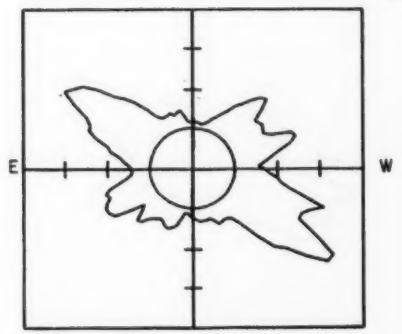
FAIR	M
35- 7000-3.0	
41- 3600-3.5	
42- 2200-2.5	
43- 4500-3.5	
45- 1000-2.5	

NOVEMBER 9, 1978 (P = 23.03, B_o = 3.53, L_o = 61.17)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å



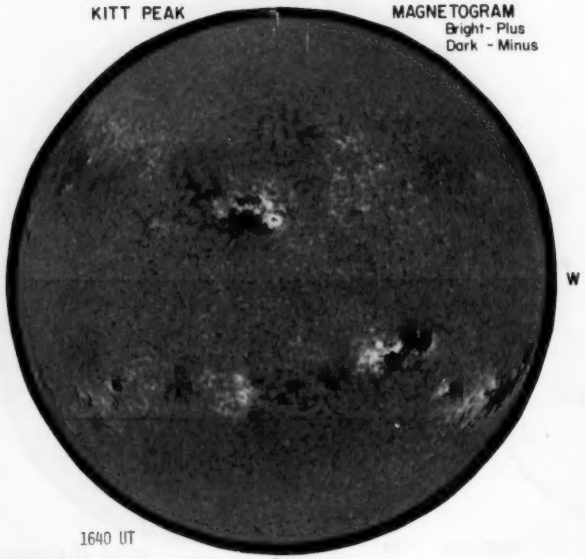
1553 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus



1640 UT

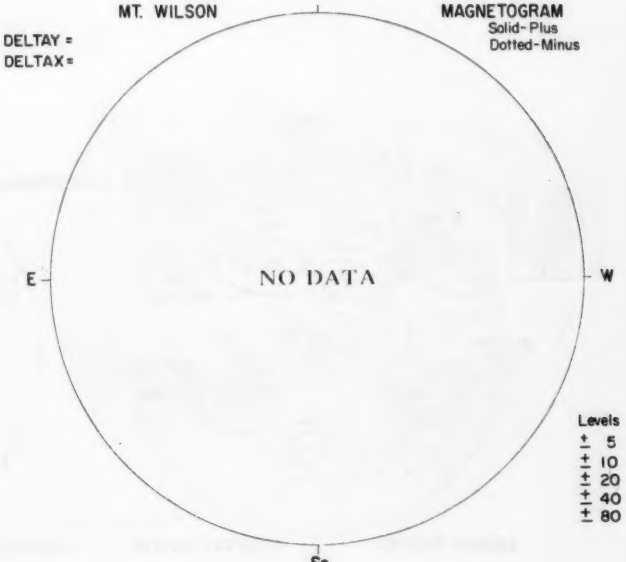
Sp

MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

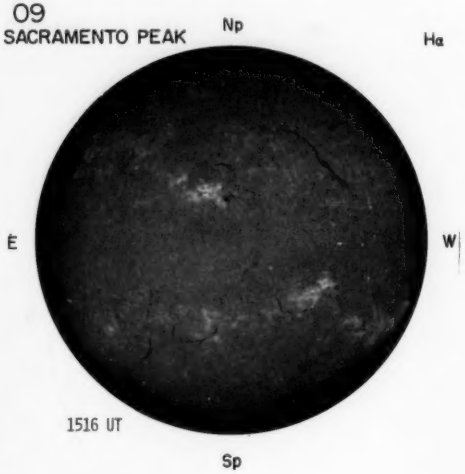


Levels
± 5
± 10
± 20
± 40
± 80

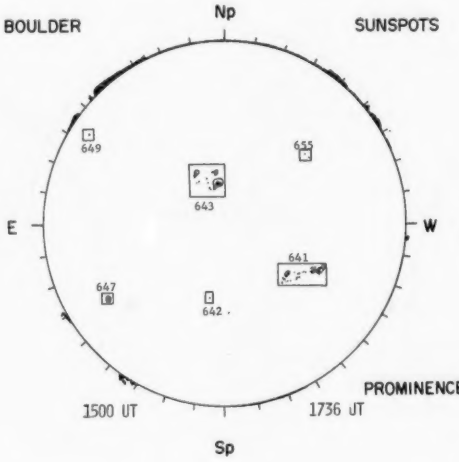
Sp

09

SACRAMENTO PEAK



Hα BOULDER

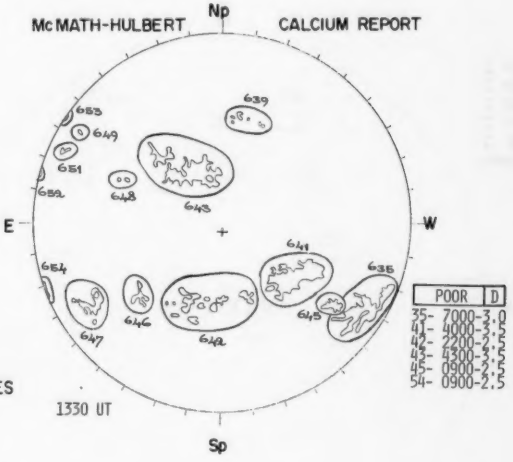


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

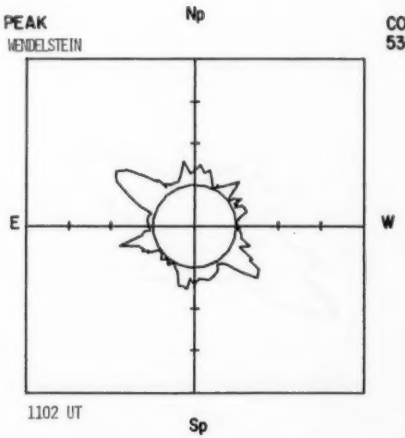


POOR	D
35- 7000-3.0	
41- 4000-3.5	
42- 2200-2.5	
43- 0300-3.5	
45- 0900-2.5	
54- 0900-2.5	

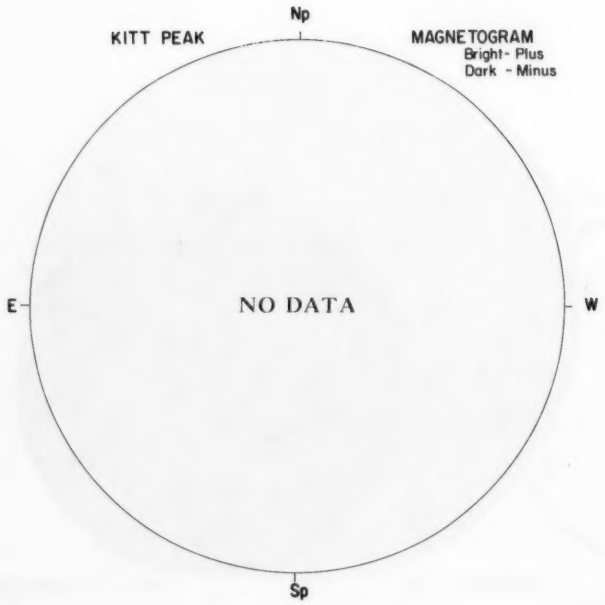
NOVEMBER 10, 1978 (P = 22.80, B_o = 3.42, L_o = 47.98)

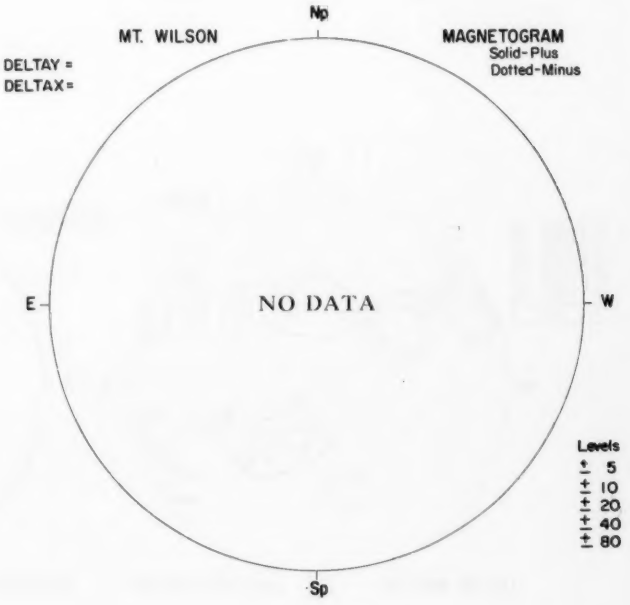
SACRAMENTO PEAK
WENDELSTEIN

CORONA (1.15 $R_\odot$)
5303 Å



1102 UT





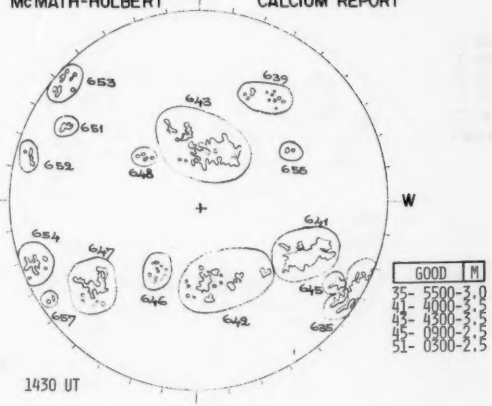
10

SACRAMENTO PEAK Hα

BOULDER SUNSPOTS

PROMINENCES

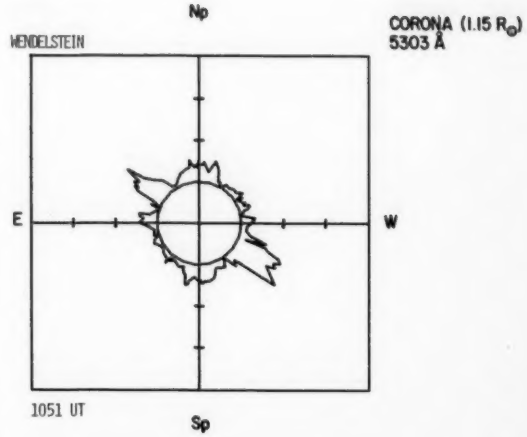
McMATH-HULBERT CALCIUM REPORT

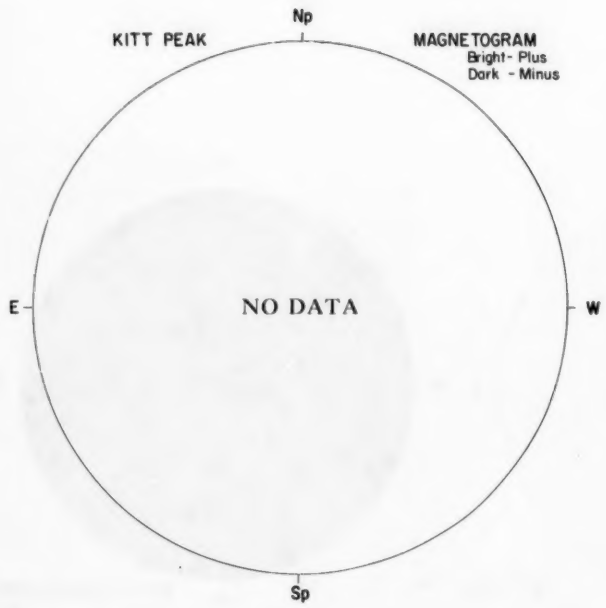


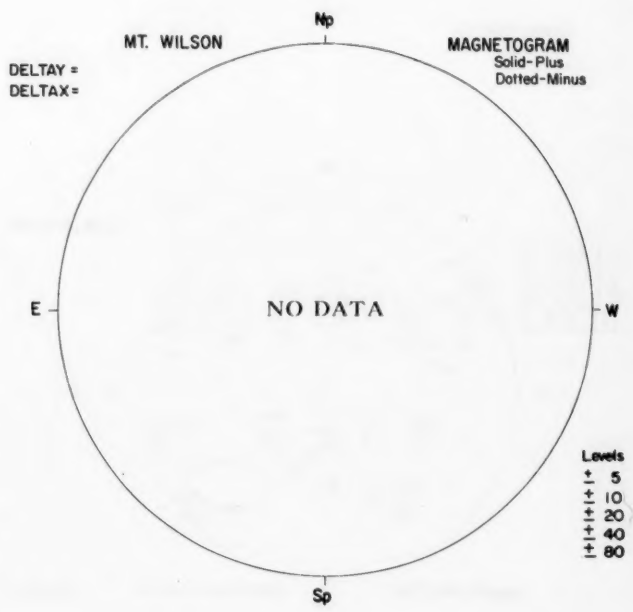
GOOD	M
35- 5500-3.0	
41- 4000-3.5	
43- 4300-3.5	
45- 0900-2.5	
51- 0300-2.5	

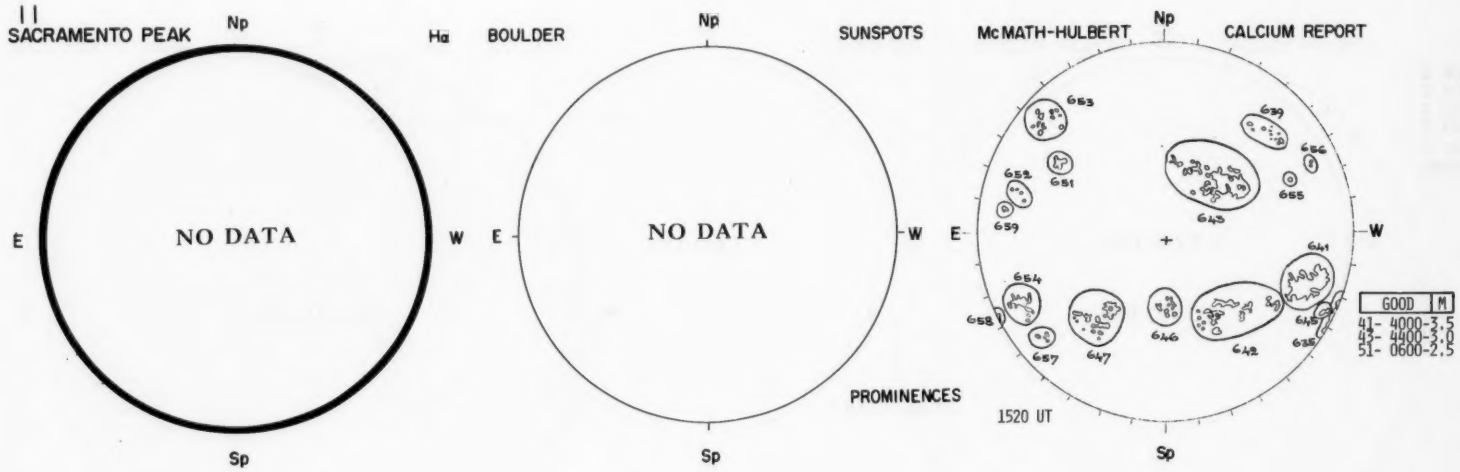
67
Nov 78

NOVEMBER 11, 1978 (P = 22.56, B_o = 3.31, L_o = 34.80)

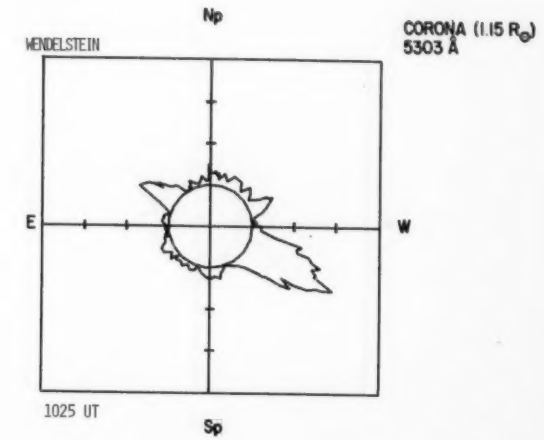


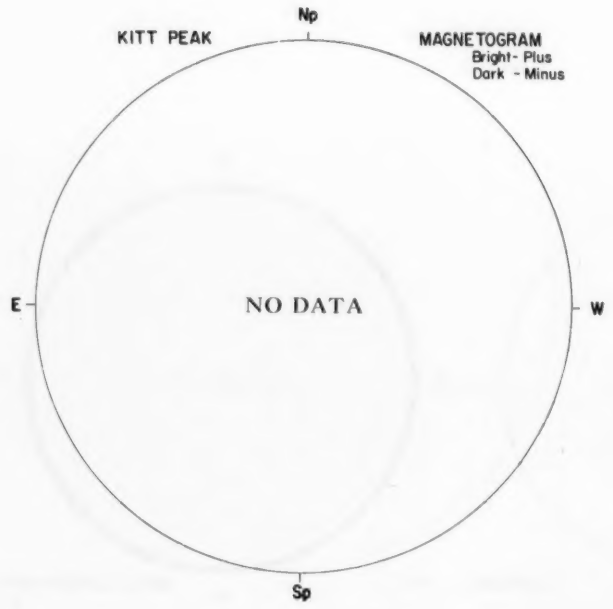


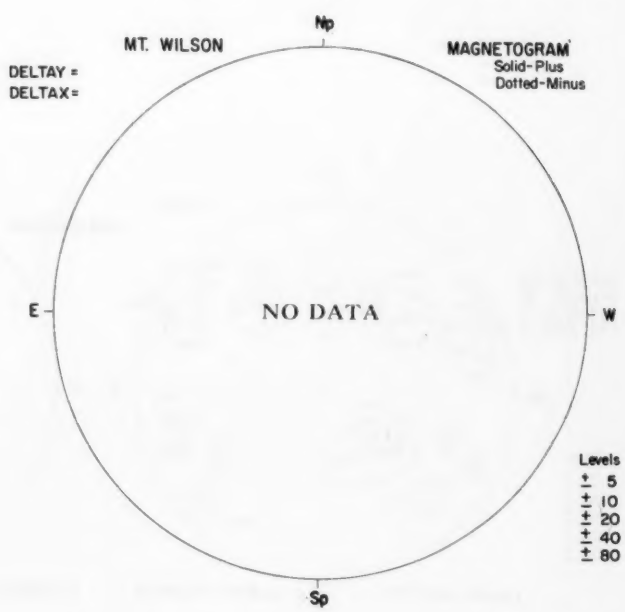



SACRAMENTO PEAK
Np
Ha
E
NO DATA
W
Sp
BOULDER
Np
E
NO DATA
W
Sp
SUNSPOTS
PROMINENCES
McMATH-HULBERT
Np
CALCIUM REPORT
E
W
Sp
1520 UT
GOOD | M
41- 4000-3.5
43- 4400-3.0
51- 0600-2.5

NOVEMBER 12, 1978 (P = 22.31, B_0 = 3.20, L_0 = 21.61)

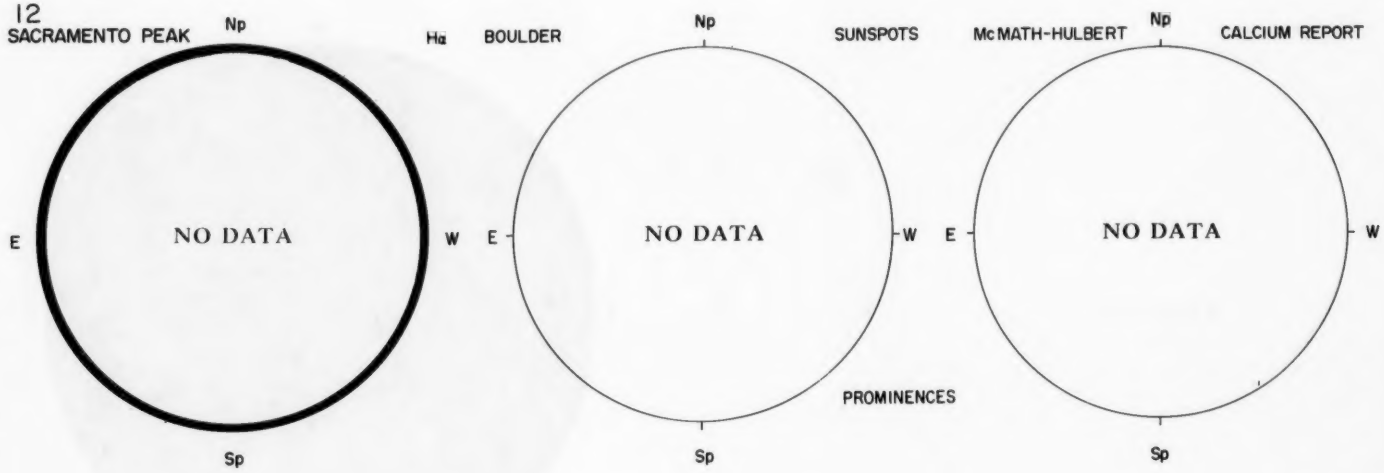






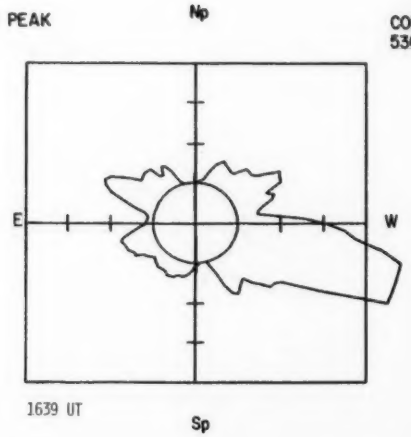
12

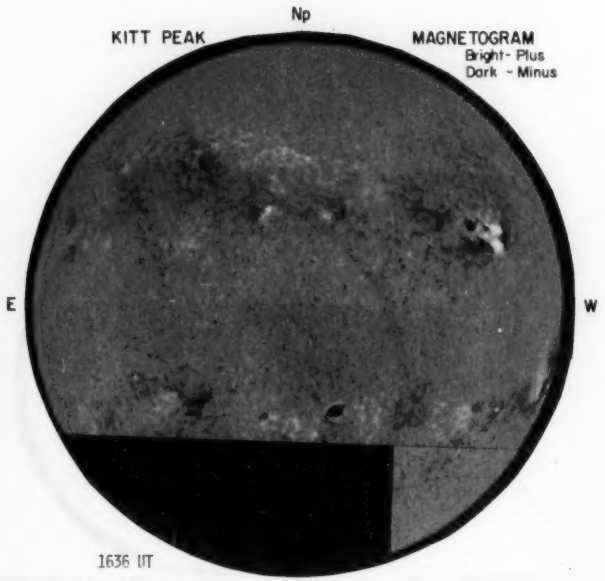
SACRAMENTO PEAK Hα BOULDER SUNSPOTS McMATH-HULBERT CALCIUM REPORT

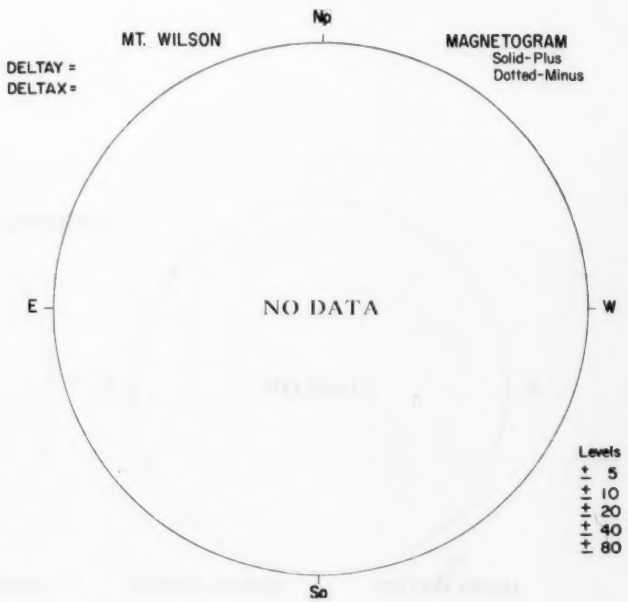


NOVEMBER 13, 1978 (P = 22.06, B_o = 3.08, L_o = 8.43)

SACRAMENTO PEAK

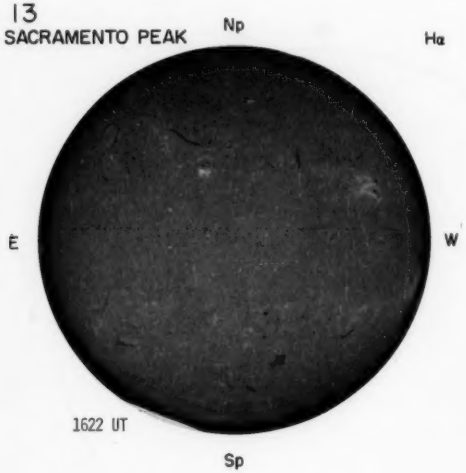




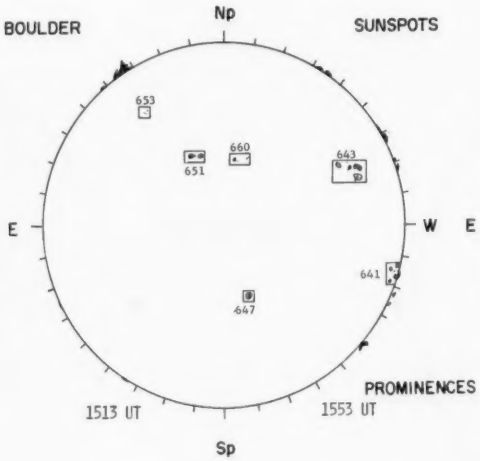


13

SACRAMENTO PEAK



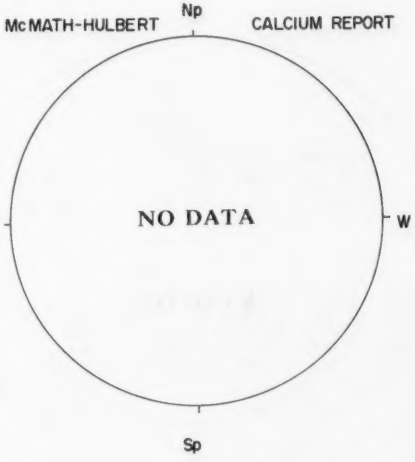
Hα BOULDER



SUNSPOTS

PROMINENCES

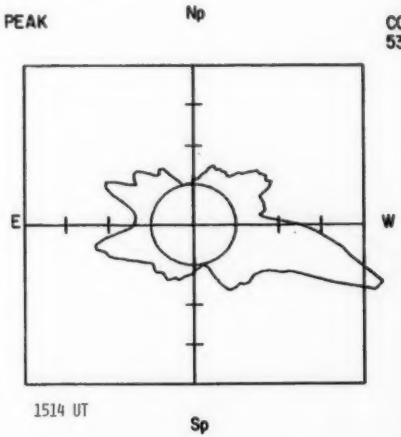
McMATH-HULBERT

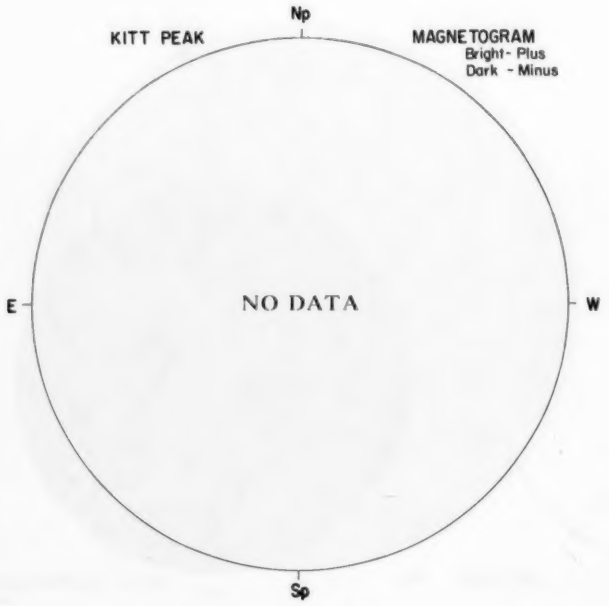


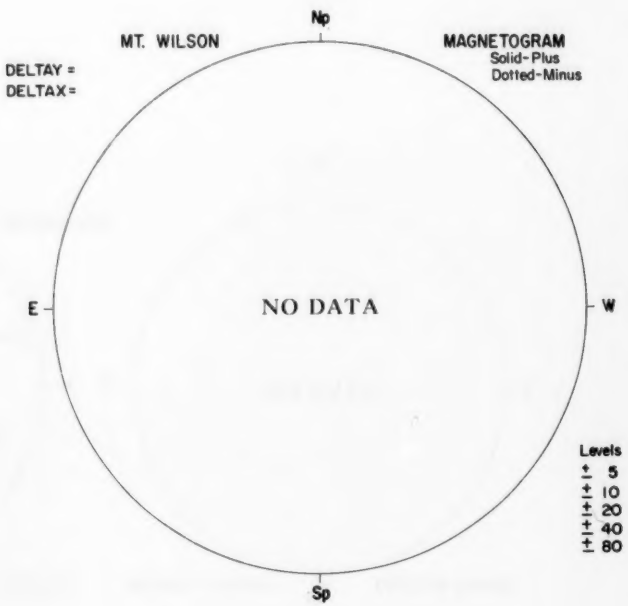
CALCIUM REPORT

NOVEMBER 14, 1978 (P = 21.80, B_o = 2.97, L_o = 355.25)

SACRAMENTO PEAK







14

SACRAMENTO PEAK Np Hα

E W

1518 UT

Sp

BOULDER Np

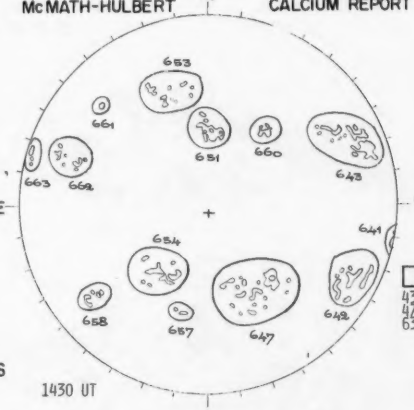
NO DATA

E W

PROMINENCES

Sp

SUNSPOTS McMATH-HULBERT Np



E W

1430 UT

Sp

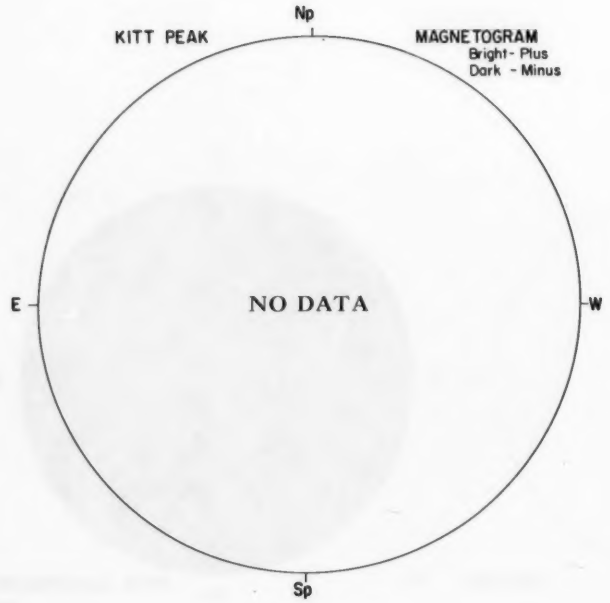
CALCIUM REPORT

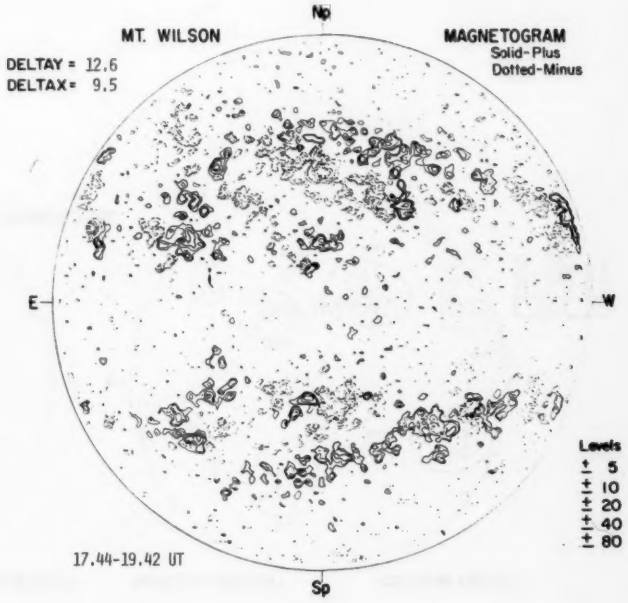
FAIR	D
43- 4100	3.0
47- 2000	2.5
63- 0500	2.5

NOVEMBER 15, 1978 (P = 21.53, B_o = 2.85, L_o = 342.06)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



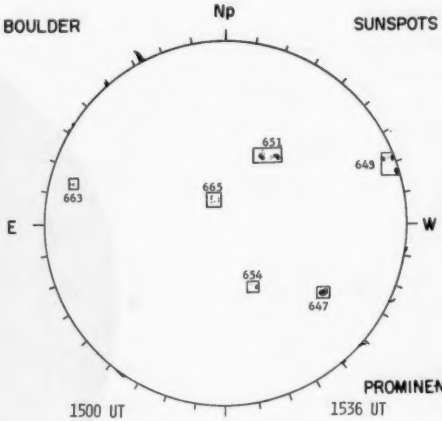


15

SACRAMENTO PEAK Hα

1530 UT

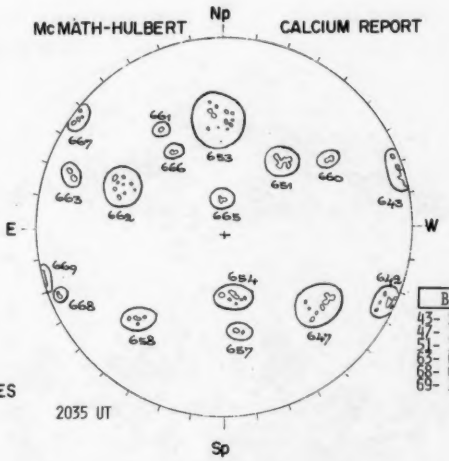
BOULDER SUNSPOTS



1500 UT 1536 UT

PROMINENCES

McMATH-HULBERT CALCIUM REPORT



2035 UT

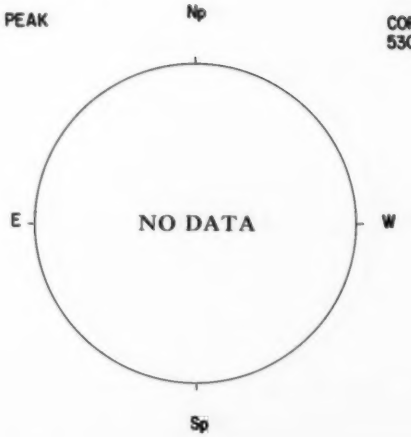
BAD	M
43- 2700-	3.0
47- 1800-	2.5
51- 1400-	2.5
63- 0500-	2.5
68- 0400-	2.5
69- 1200-	2.5

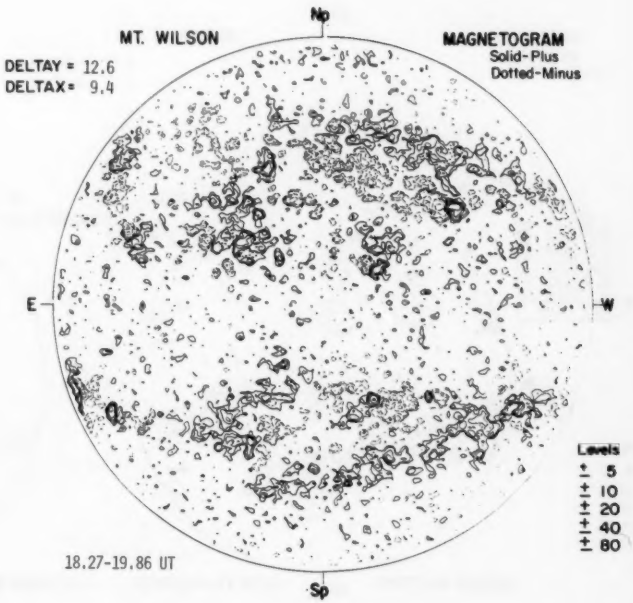
77
Nov 78

NOVEMBER 16, 1978 (P = 21.25, B_0 = 2.73, L_0 = 328.88)

SACRAMENTO PEAK

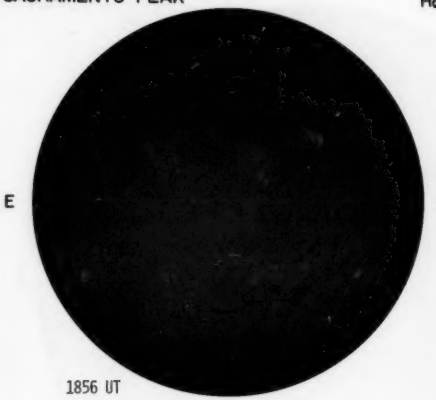
CORONA (1.15 $R_\odot$)
5303 Å





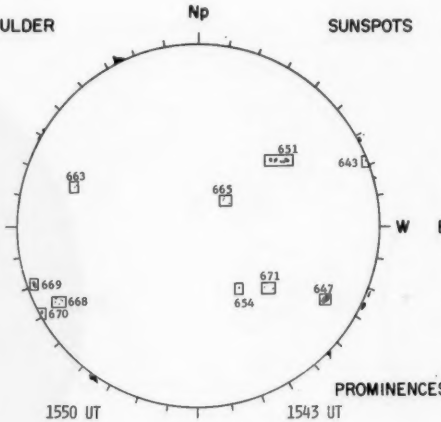
16

SACRAMENTO PEAK Np



1856 UT

Hα BOULDER Np

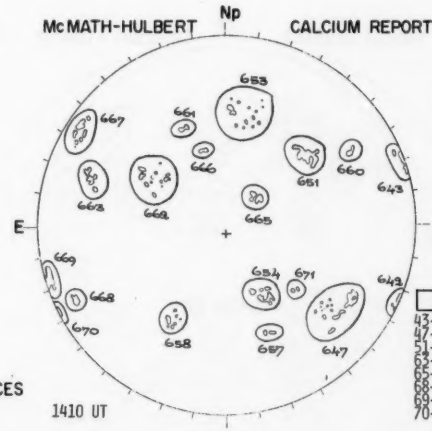


1550 UT 1543 UT

SUNSPOTS

PROMINENCES

McMATH-HULBERT Np



1410 UT

CALCIUM REPORT

FAIR	M
43- 2100-3.0	
47- 1600-2.5	
51- 1600-3.0	
63- 0700-2.5	
65- 0300-2.5	
68- 0500-3.0	
69- 3500-2.5	
70- 0900-2.5	

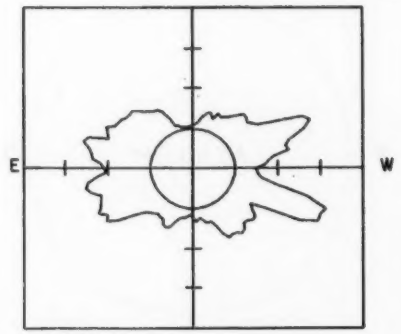
79
Nov 78

NOVEMBER 17, 1978 (P = 20.97, B_0 = 2.61, L_0 = 315.70)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å



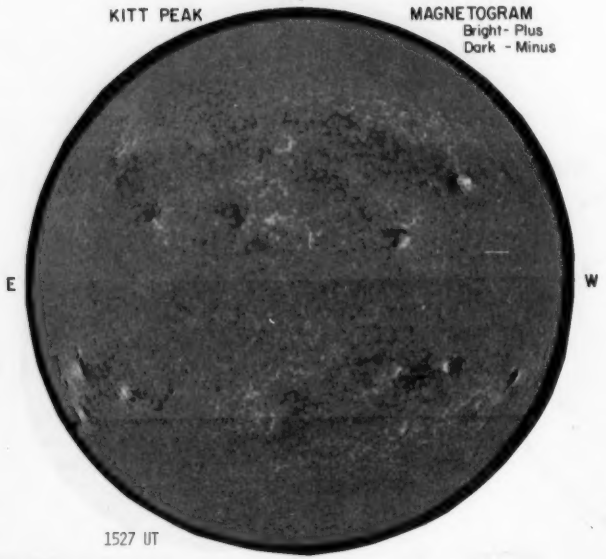
1844 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus



1527 UT

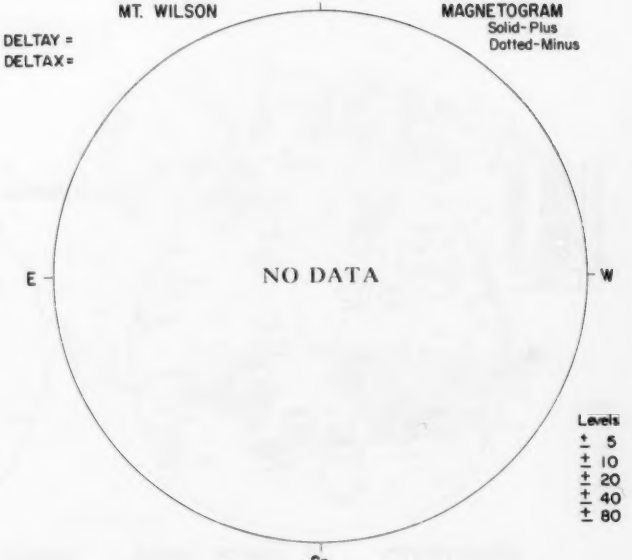
Sp

MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

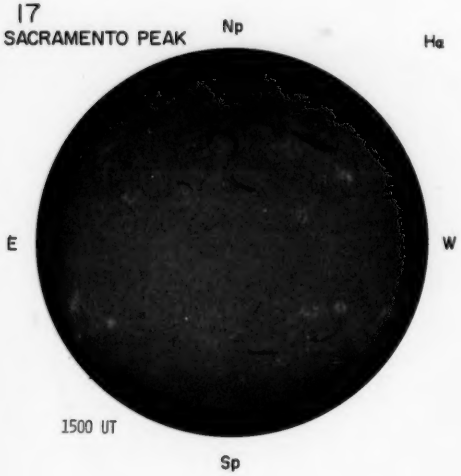


Levels
± 5
± 10
± 20
± 40
± 80

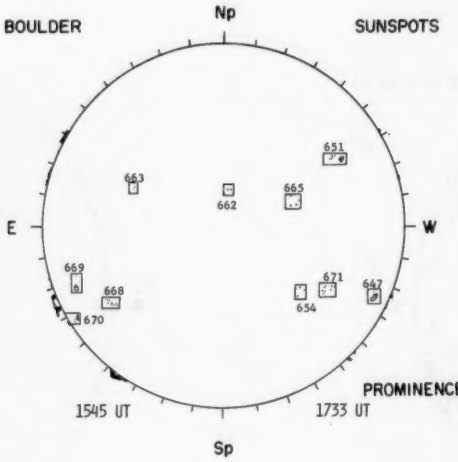
Sp

17

SACRAMENTO PEAK



Hα BOULDER

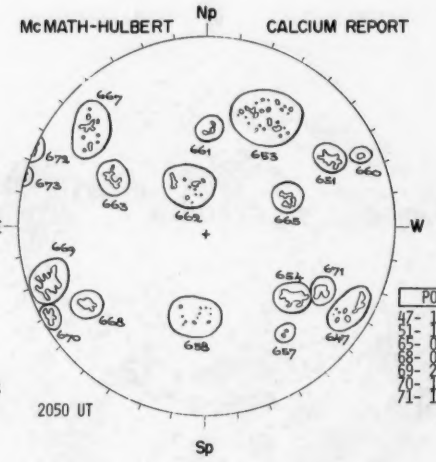


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT



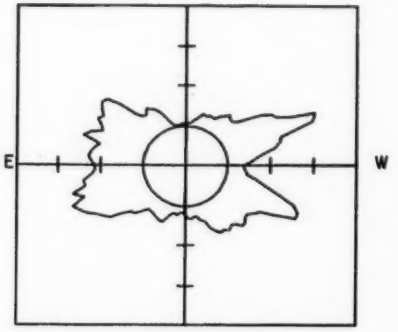
POOR	M
47- 1300	2.5
51- 1600	3.0
65- 0500	2.5
68- 0800	3.0
69- 2700	3.0
70- 1300	3.0
71- 1200	2.5

NOVEMBER 18, 1978 (P = 20.68, B_o = 2.49, L_o = 302.52)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å



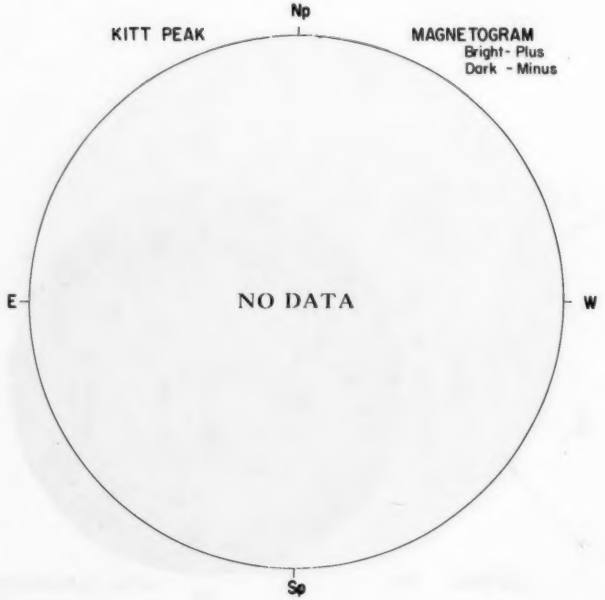
1751 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus

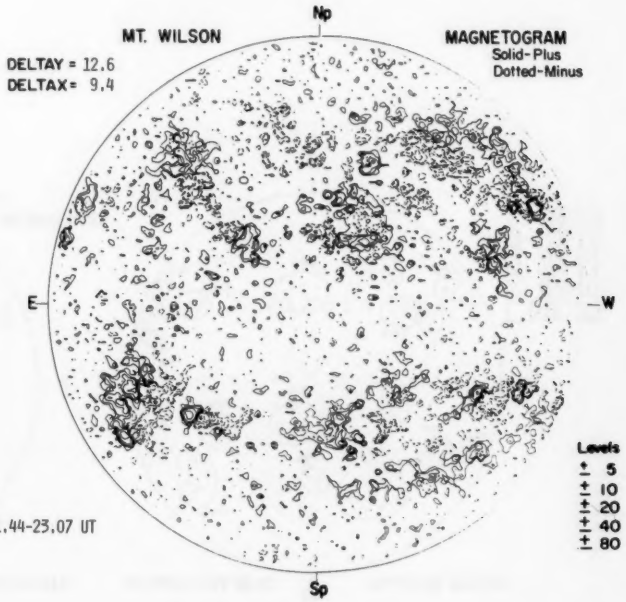


MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.4

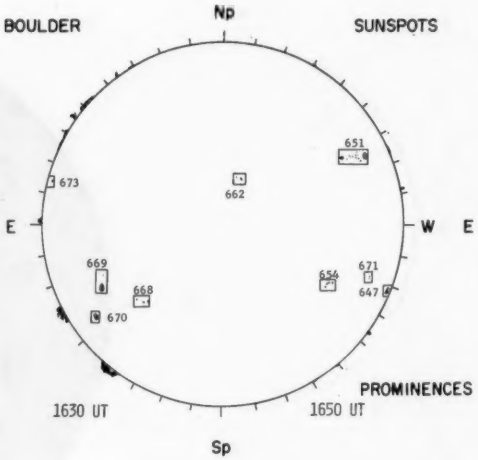


21.44-23.07 UT

18

SACRAMENTO PEAK

Hα BOULDER

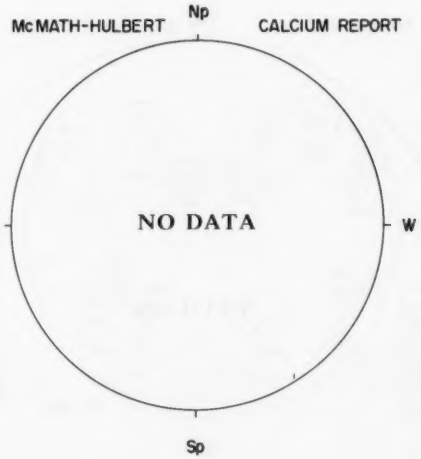


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

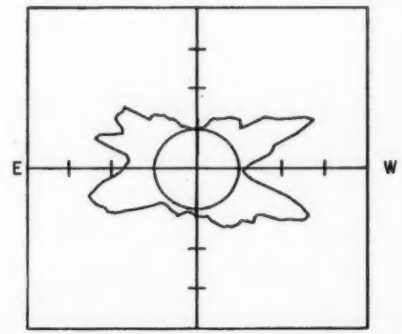


NOVEMBER 19, 1978 (P = 20.38, B_o = 2.38, L_o = 289.33)

SACRAMENTO PEAK

Np

CORONA (1.15 R_o)
5303 Å



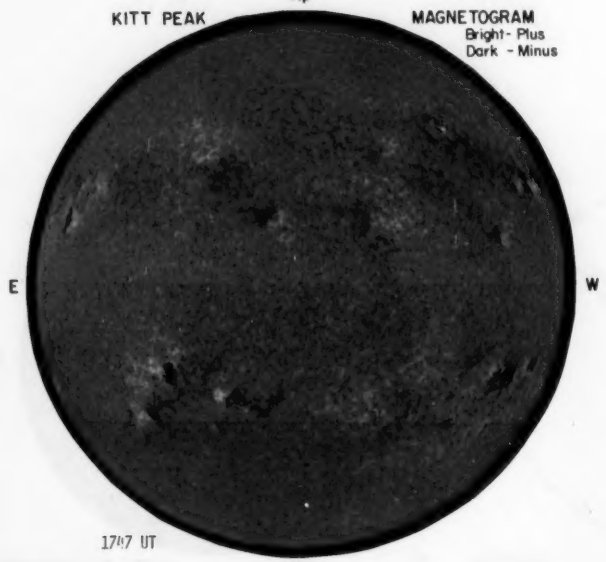
1616 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus



17h7 UT

Sp

MT. WILSON

Np

DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

E

NO DATA

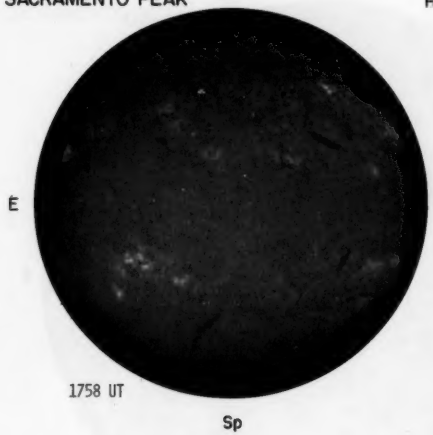
W

Levels
± 5
± 10
± 20
± 40
± 80

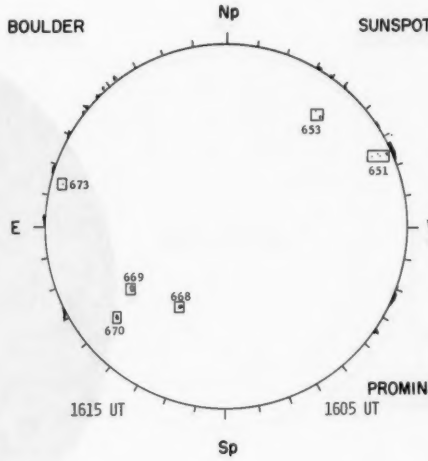
Sp

19

SACRAMENTO PEAK



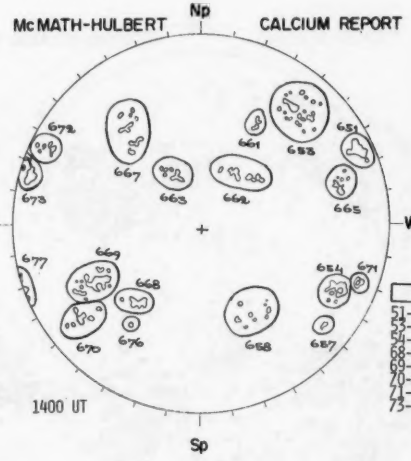
Ha BOULDER



SUNSPOTS

McMATH-HULBERT

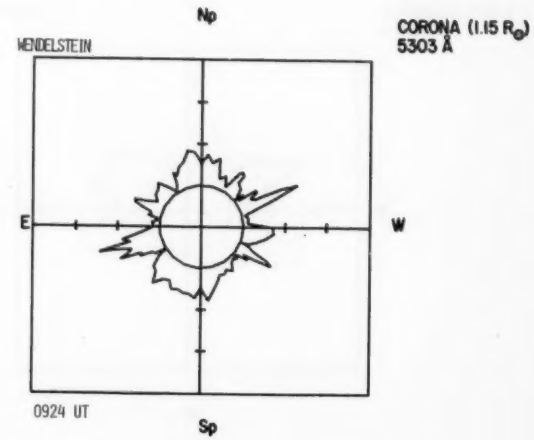
CALCIUM REPORT

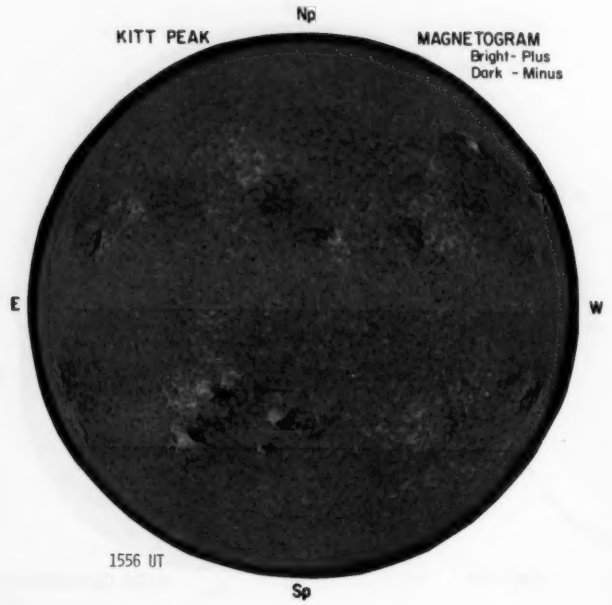


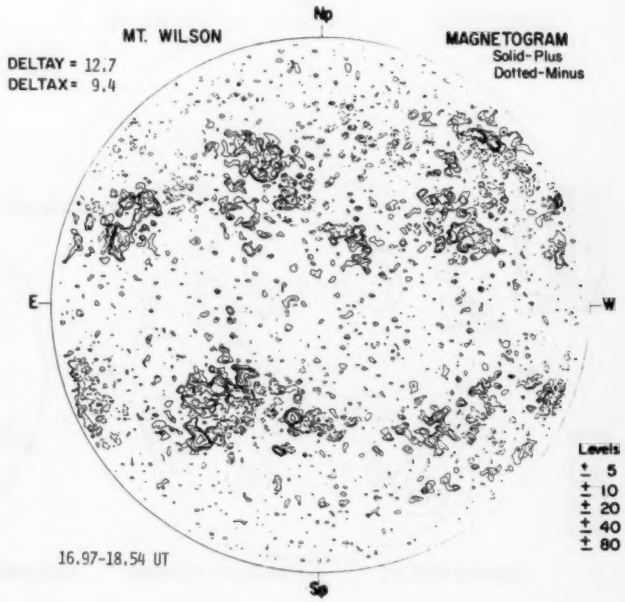
PROMINENCES

FAIR	D
51- 1600-3.0	
53- 1700-3.5	
54- 1000-2.5	
68- 0800-3.0	
69- 1800-3.0	
70- 1000-3.5	
71- 0700-2.5	
73- 1400-2.5	

NOVEMBER 20, 1978 (P = 20.07, B_o = 2.25, L_o = 276.15)

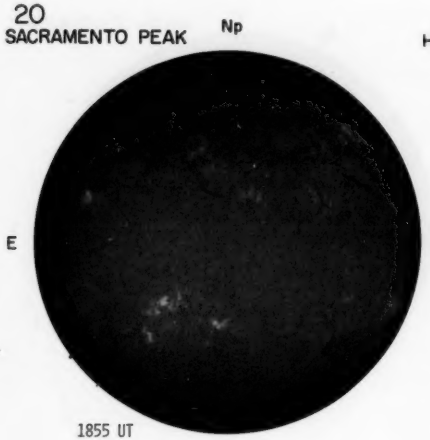




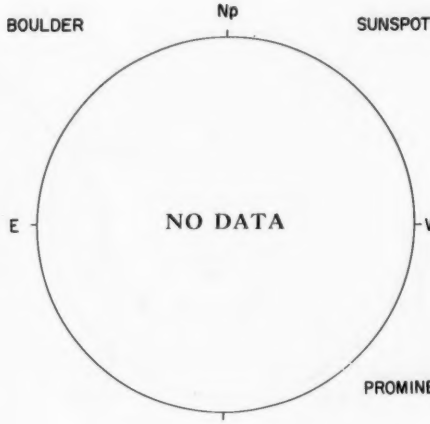


20

SACRAMENTO PEAK



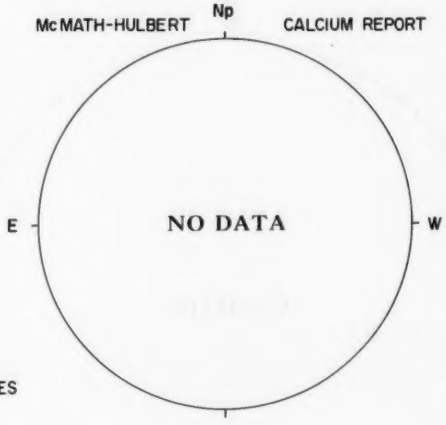
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT

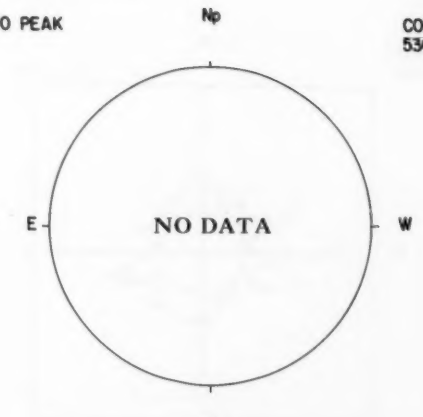


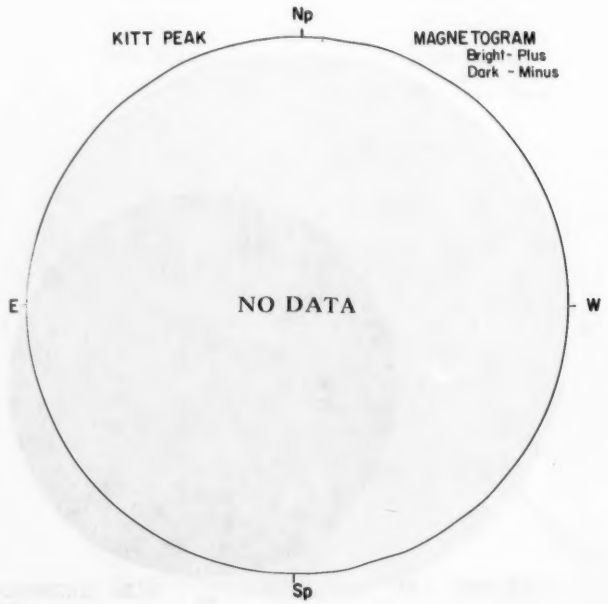
CALCIUM REPORT

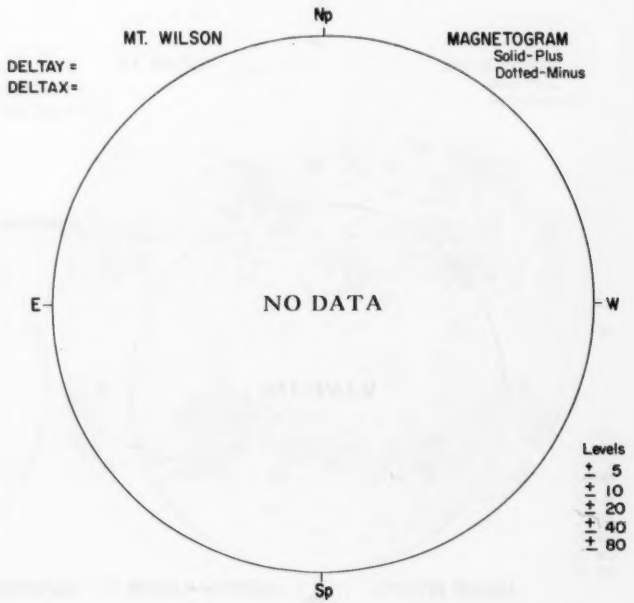
NOVEMBER 21, 1978 (P = 19.76, B_0 = 2.13, L = 262.97)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

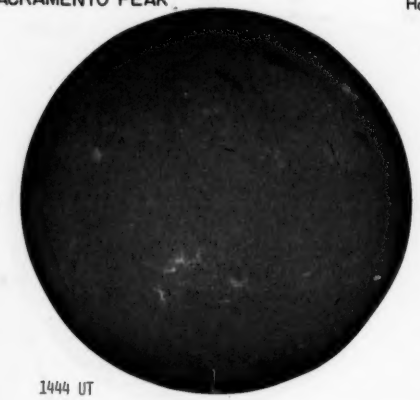




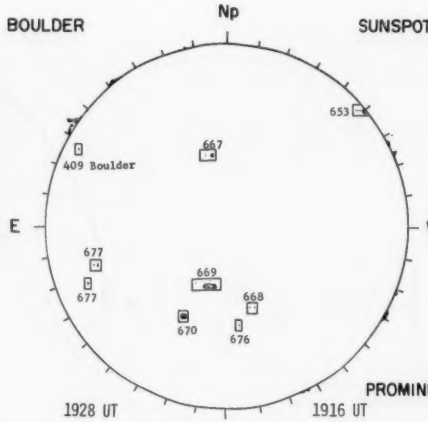


21

SACRAMENTO PEAK



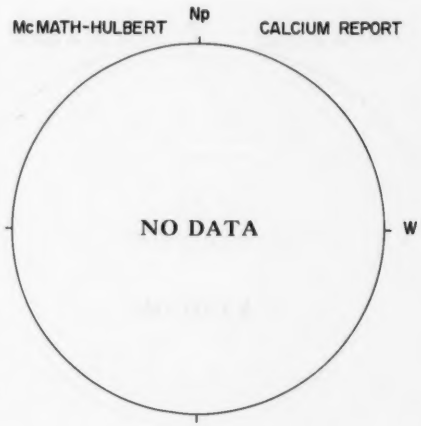
Hα BOULDER



SUNSPOTS

PROMINENCES

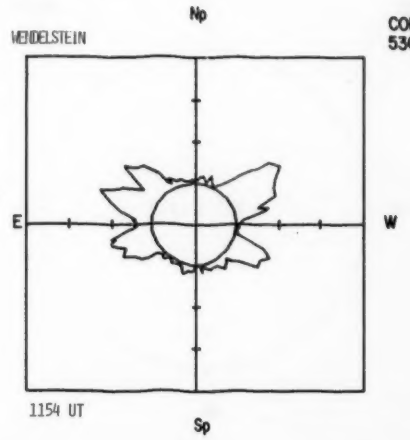
McMATH-HULBERT

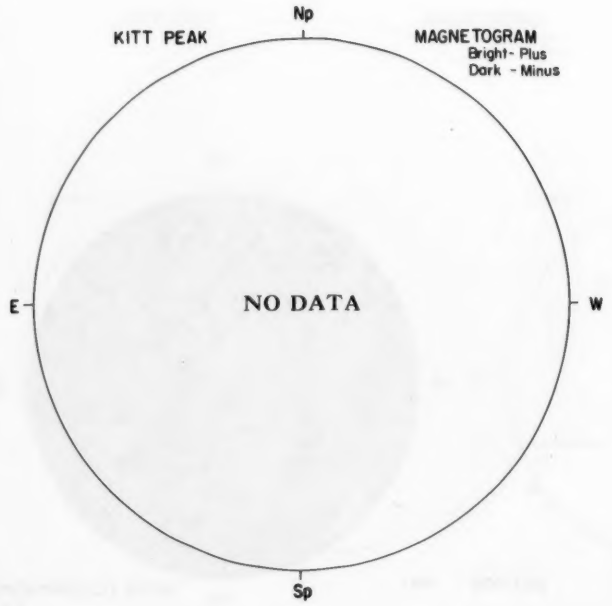


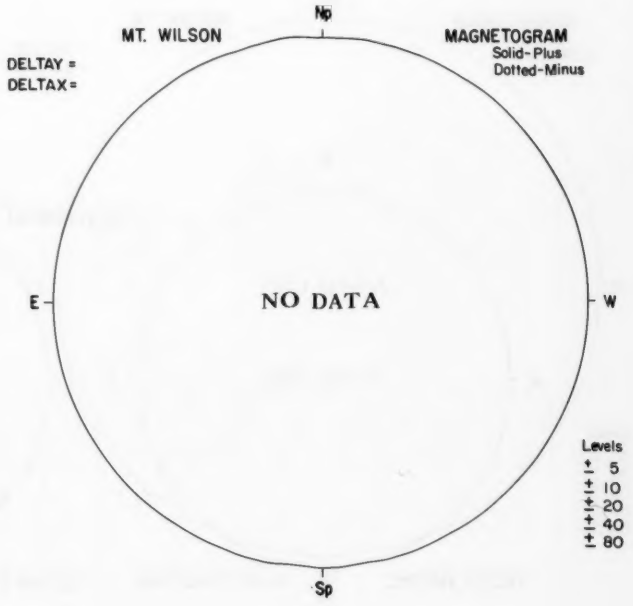
NO DATA

CALCIUM REPORT

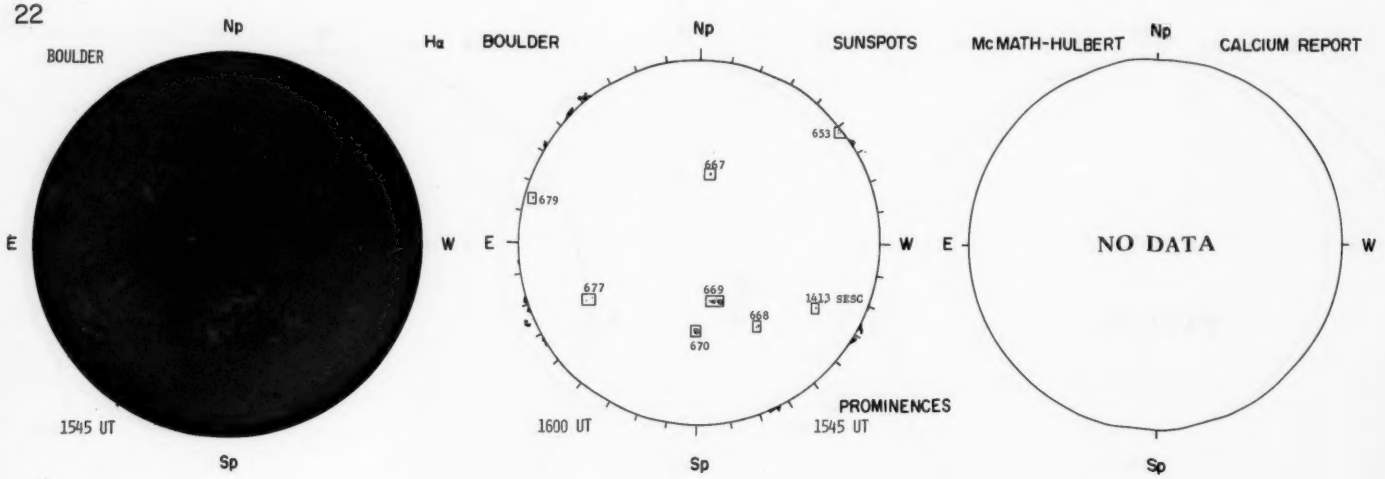
NOVEMBER 22, 1978 (P = 19.44, B_o = 2.01, L_o = 249.79)







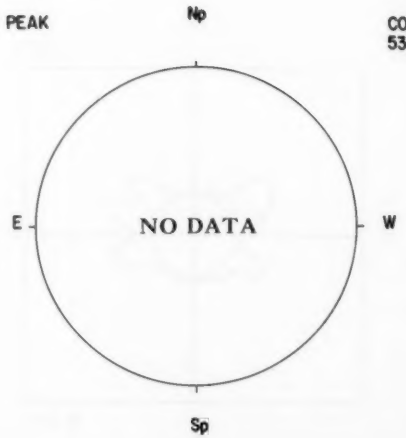
22

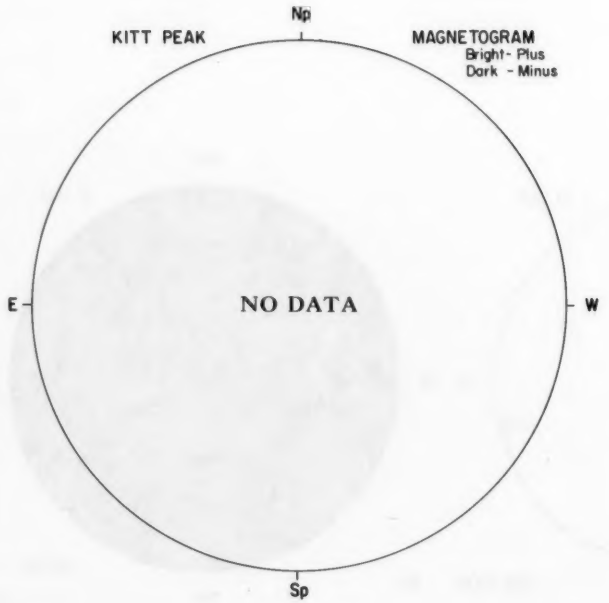

Np
BOULDER
E
W
1545 UT
Sp
Hα BOULDER
Np
SUNSPOTS
653
667
679
677
669
1413 SESC
668
670
E
W
1600 UT
Sp
PROMINENCES
1545 UT
McMATH-HULBERT
Np
CALCIUM REPORT
NO DATA
E
W
Sp

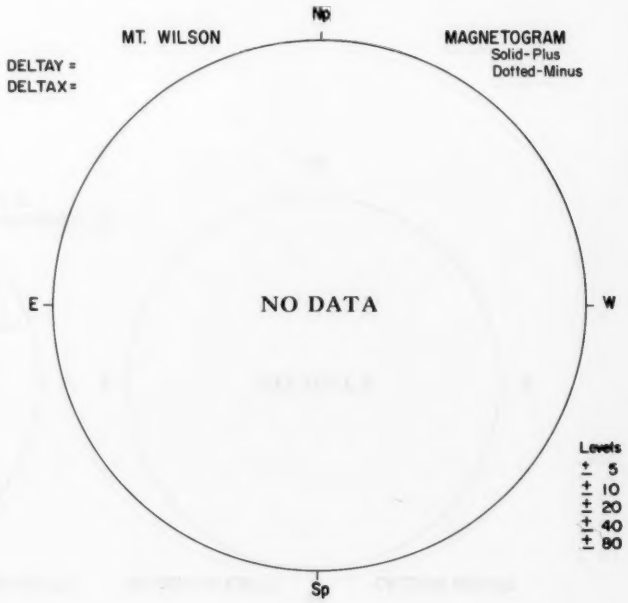
NOVEMBER 23, 1978 (P = 19.11, B_o = 1.89, L_o = 236.61)

SACRAMENTO PEAK

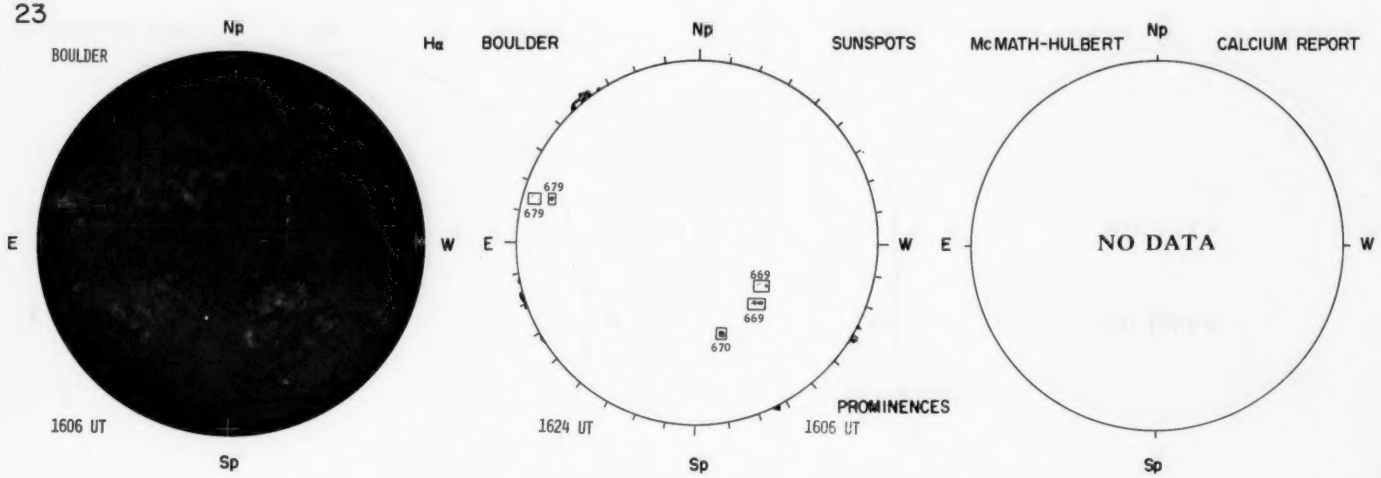
CORONA (1.15 $R_\odot$)
5303 Å







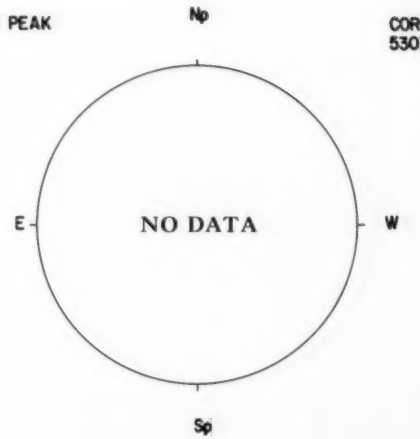
23


Np
BOULDER
E
W
Sp
1606 UT
Hα
BOULDER
Np
SUNSPOTS
679
679
669
669
670
E
W
Sp
1624 UT
PROMINENCES
1606 UT
McMATH-HULBERT
Np
CALCIUM REPORT
NO DATA
E
W
Sp

NOVEMBER 24, 1978 (P = 18.78, B_o = 1.76, L_o = 223.43)

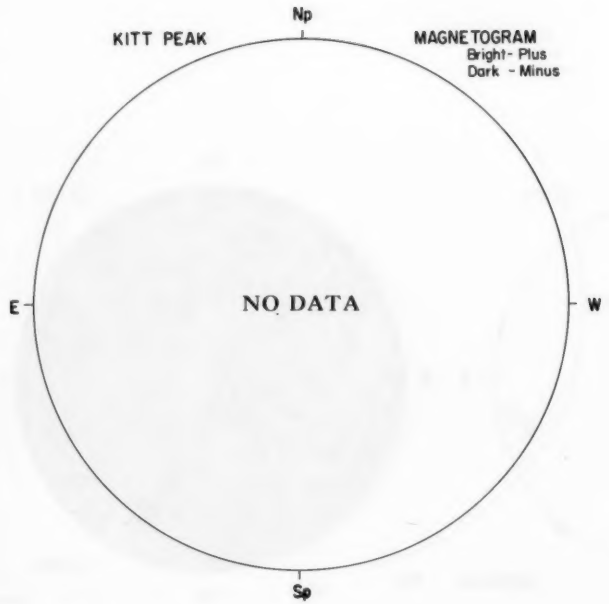
SACRAMENTO PEAK

CORONA (1.15 R_o)
5303 Å



KITT PEAK

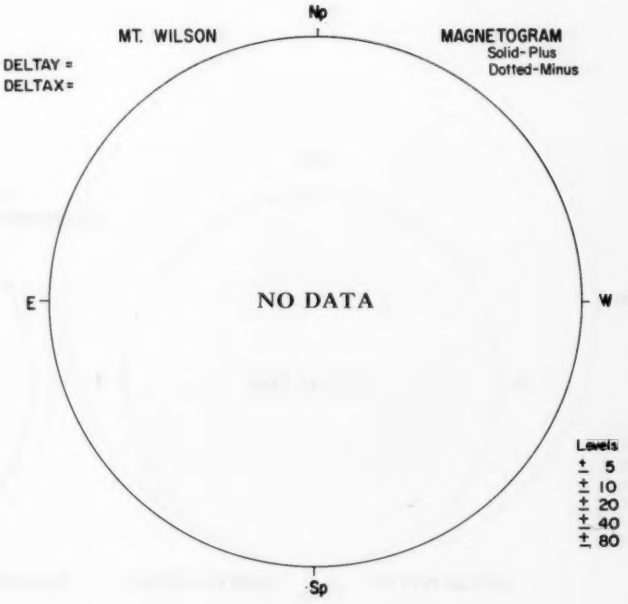
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

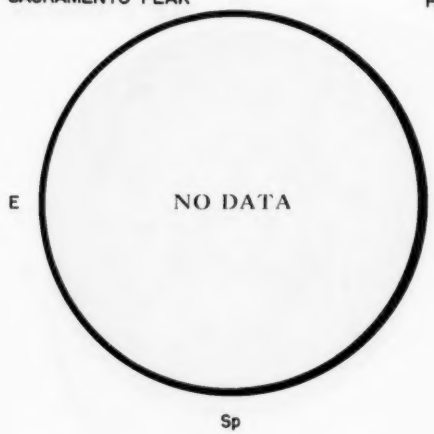
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

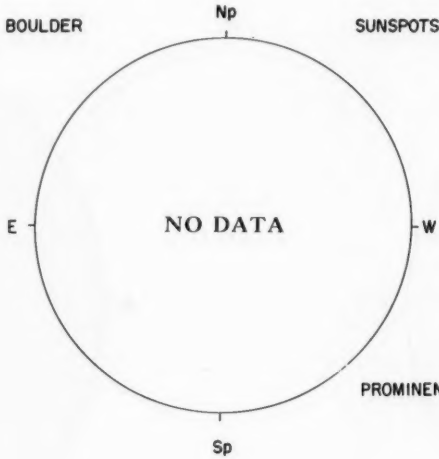


24

SACRAMENTO PEAK Np Hα

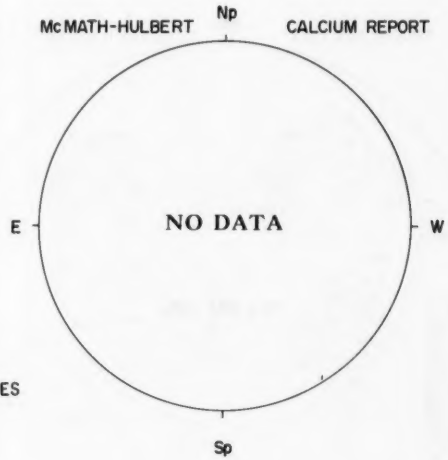


BOULDER Np SUNSPOTS

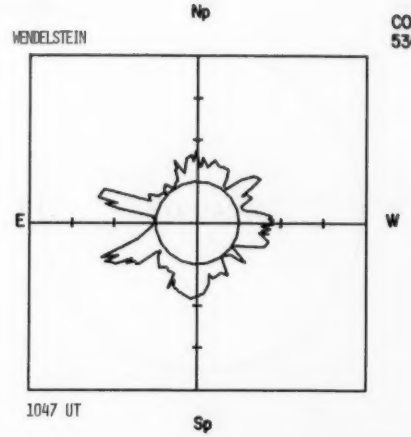


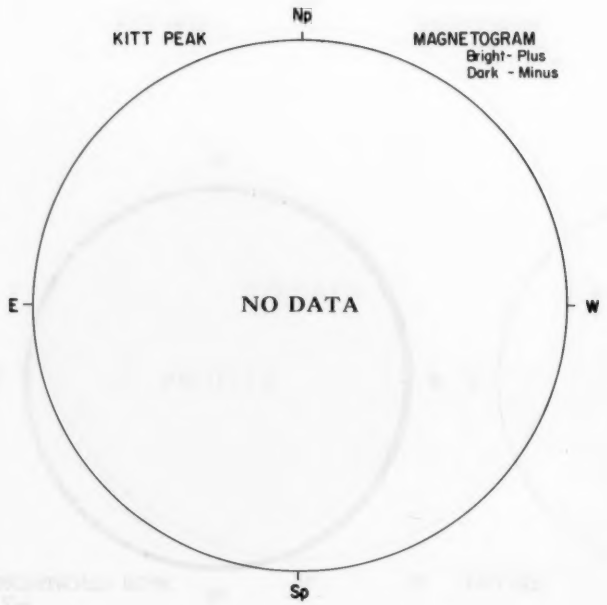
PROMINENCES

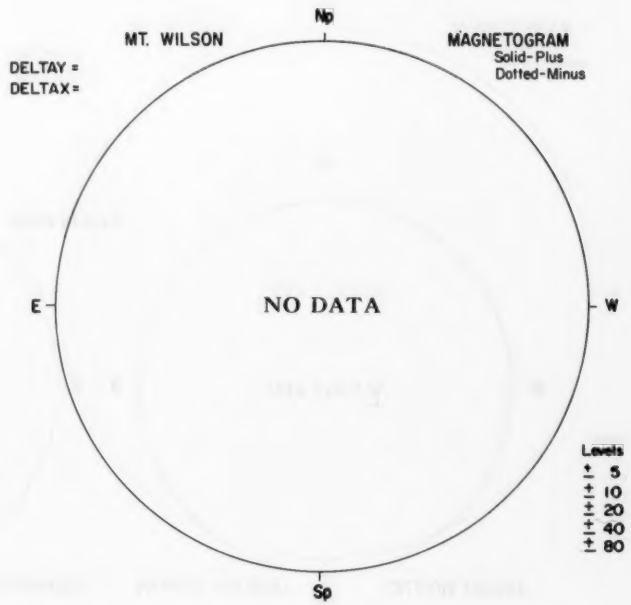
McMATH-HULBERT Np CALCIUM REPORT



NOVEMBER 25, 1978 (P = 18.44, B_o = 1.64, L_o = 210.25)

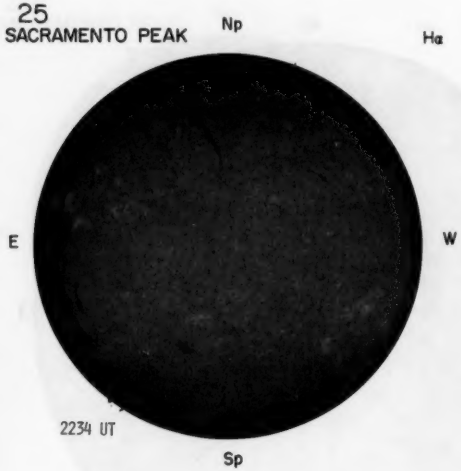




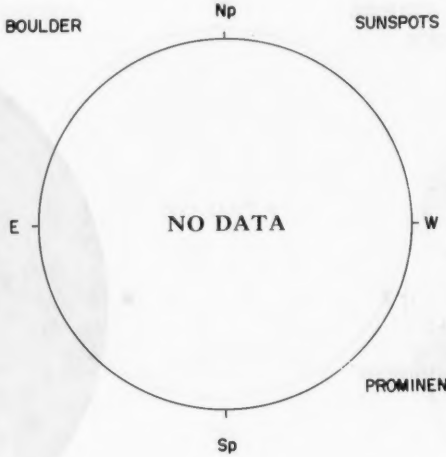


25

SACRAMENTO PEAK

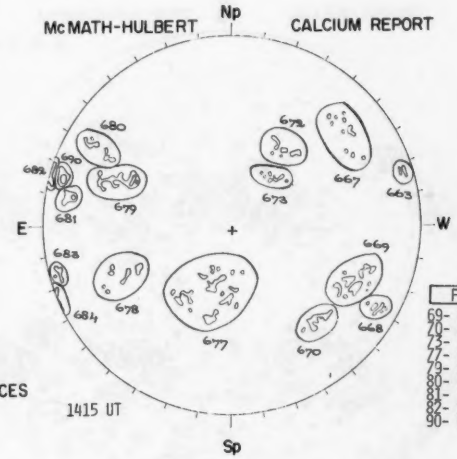


BOULDER



SUNSPOTS

McMATH-HULBERT



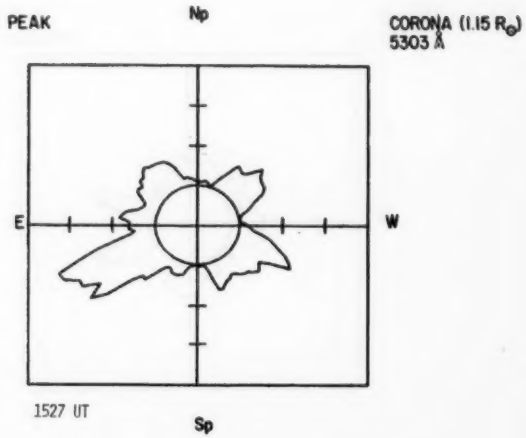
CALCIUM REPORT

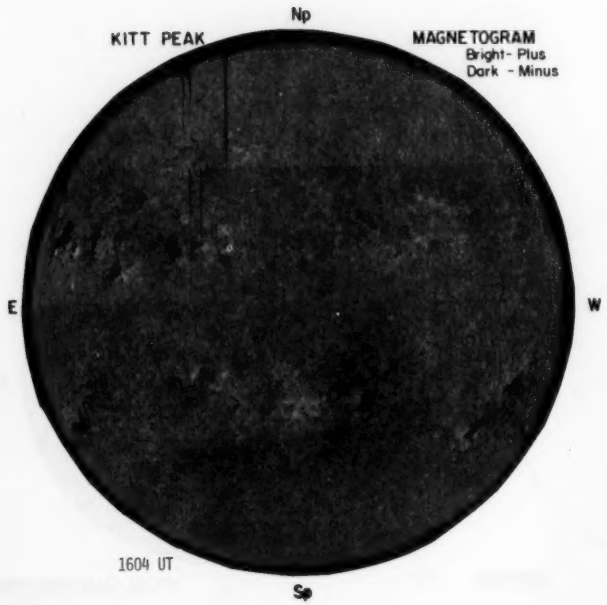
FAIR	S
69- 2000-3.0	
70- 1000-3.0	
73- 0800-2.5	
77- 2600-2.5	
79- 2000-3.0	
80- 0900-2.5	
81- 1100-3.5	
82- 2000-2.5	
90- 0800-3.0	

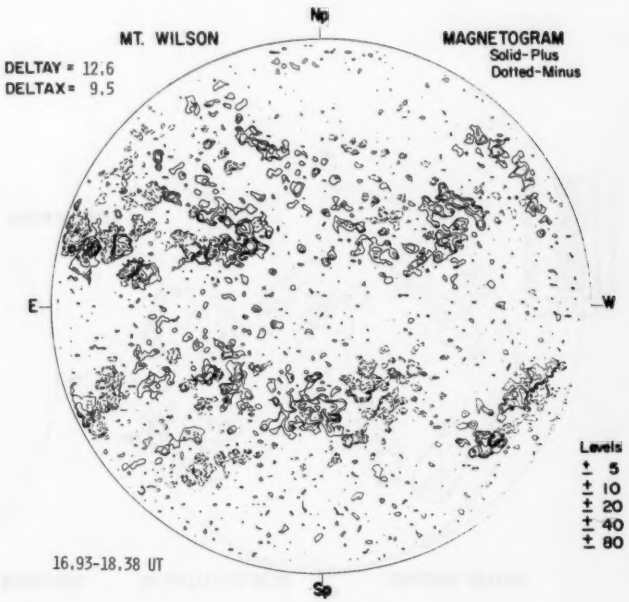
PROMINENCES

NOVEMBER 26, 1978 (P = 18.09, B_o = 1.52, L_o = 197.07)

SACRAMENTO PEAK







26

SACRAMENTO PEAK Np Hα

E W

1522 UT

Sp

BOULDER Np SUNSPOTS

E NO DATA W

Sp

McMATH-HULBERT Np CALCIUM REPORT

E NO DATA W

Sp

PROMINENCES

NOVEMBER 27, 1978 (P = 17.73, B_o = 1.39, L_o = 183.89)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

E — NO DATA — W

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus

E — NO DATA — W

Sp

MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.4

E — W

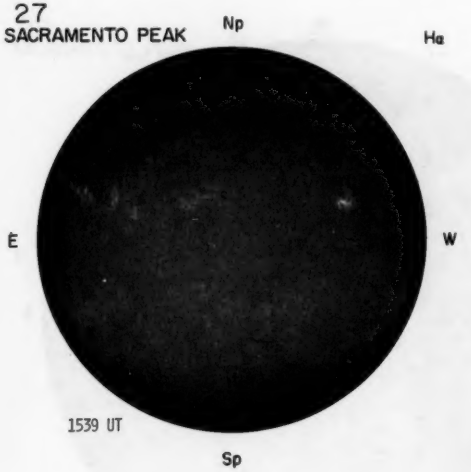
Levels
± 5
± 10
± 20
± 40
± 80

16.99-18.47 UT

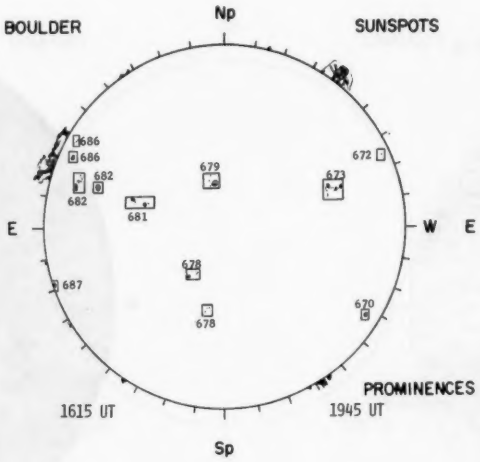
Sp

27

SACRAMENTO PEAK

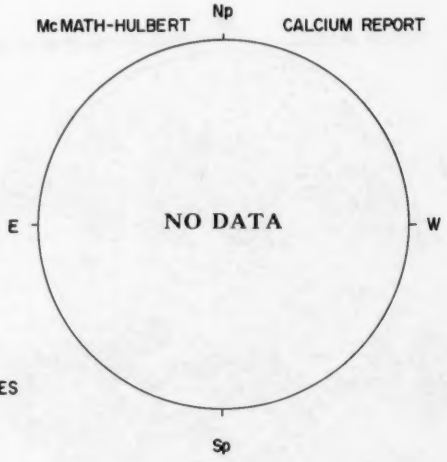


Hα BOULDER



SUNSPOTS

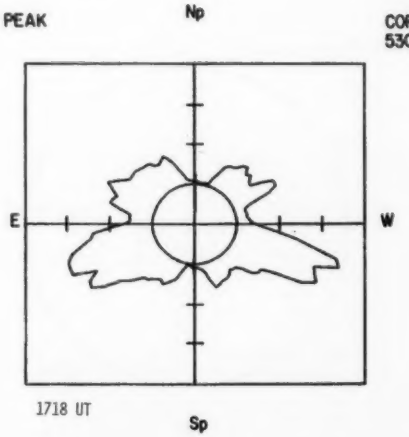
McMATH-HULBERT



CALCIUM REPORT

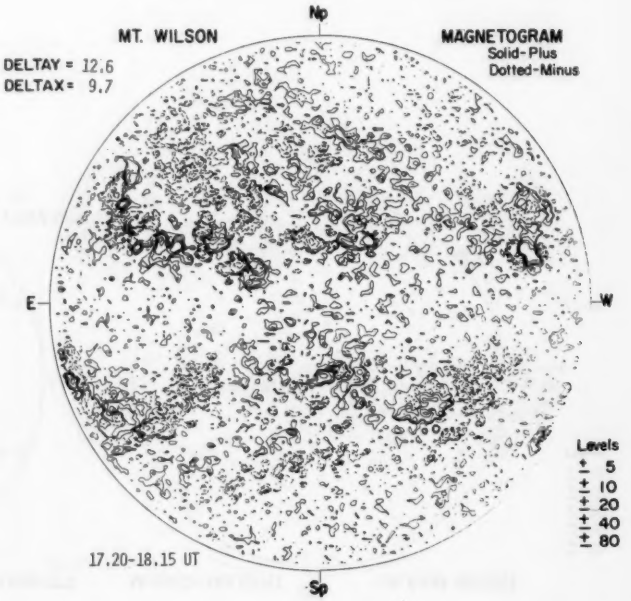
NOVEMBER 28, 1978 (P = 17.37, B_o = 1.26, L_o = 170.71)

SACRAMENTO PEAK



1718 UT

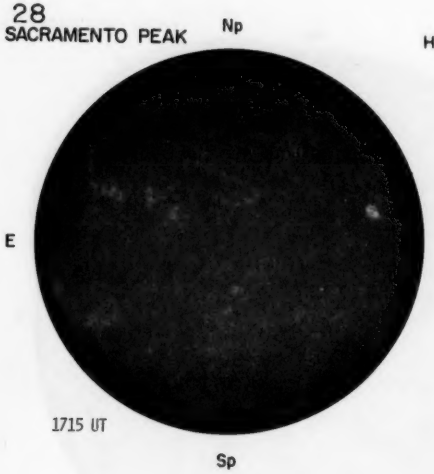
1541 UT



17.20-18.15 UT

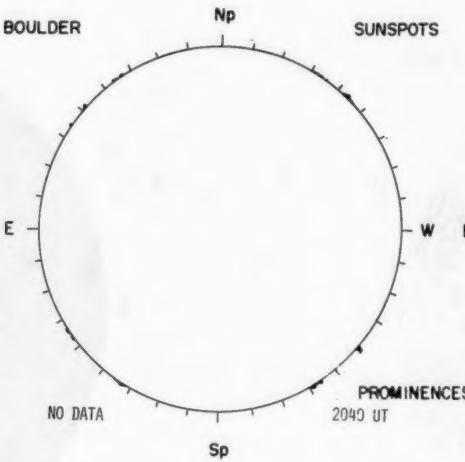
28

SACRAMENTO PEAK



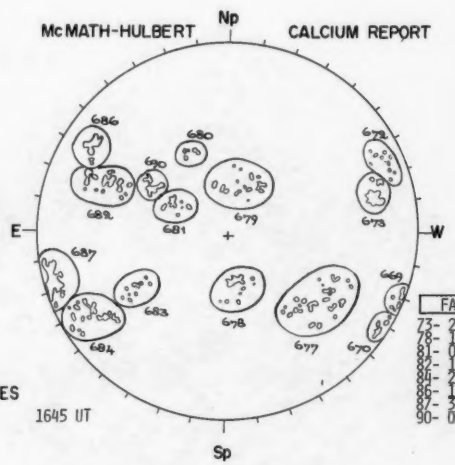
1715 UT

Hα BOULDER



NO DATA

SUNSPOTS



PROMINENCES

2040 UT

McMATH-HULBERT

CALCIUM REPORT

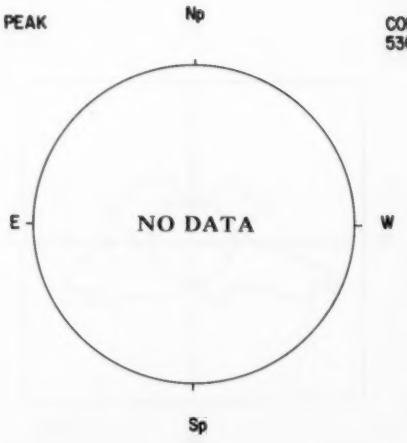
1645 UT

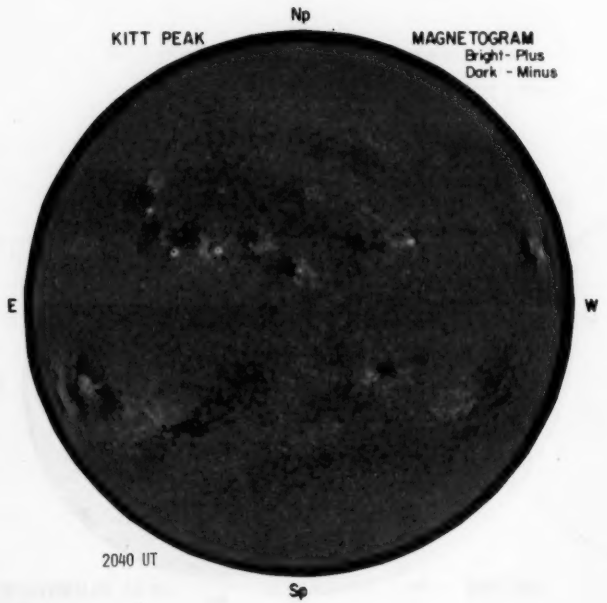
FAIR	D
73- 2000-4.0	
78- 1000-2.5	
81- 0800-2.5	
82- 1800-3.0	
84- 2300-2.5	
86- 1300-3.0	
87- 3300-3.0	
90- 0700-2.5	

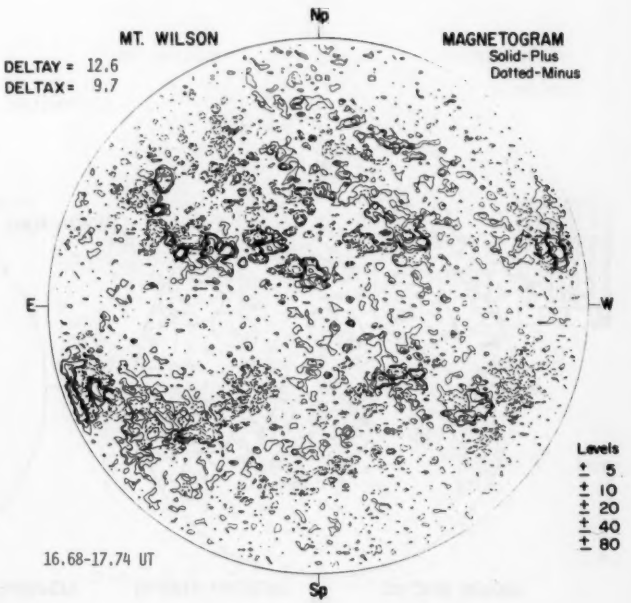
NOVEMBER 29, 1978 (P = 17.01, B_o = 1.14, L_o = 157.53)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

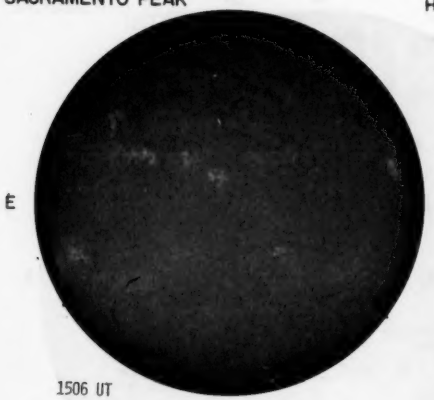






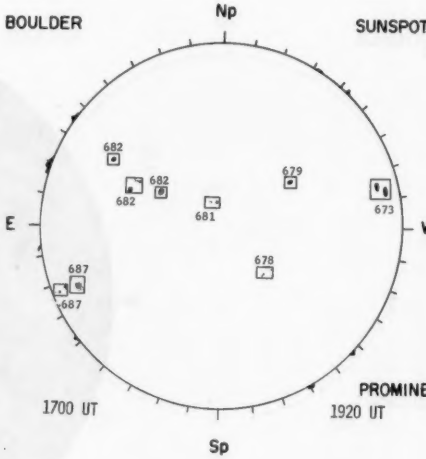
29

SACRAMENTO PEAK Np



1506 UT

Hα BOULDER Np



1700 UT

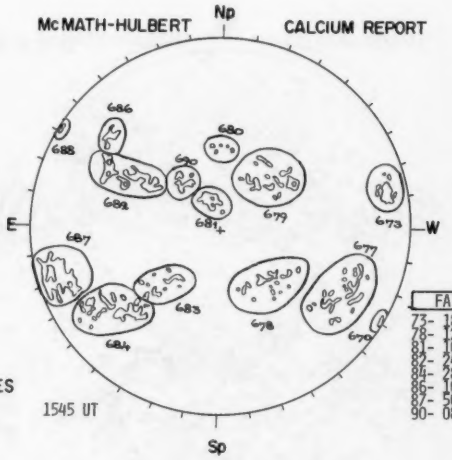
SUNSPOTS

PROMINENCES

1920 UT

McMATH-HULBERT Np

CALCIUM REPORT

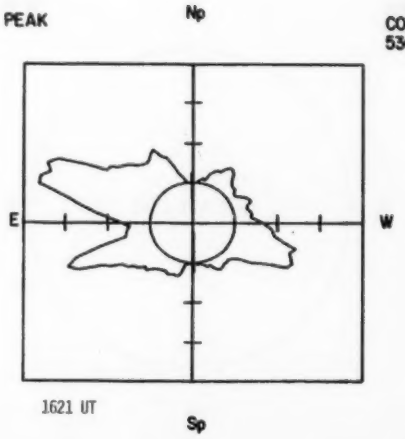


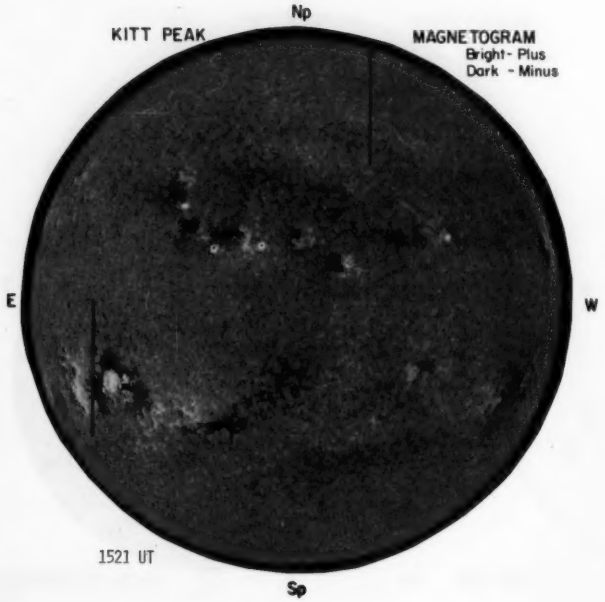
1545 UT

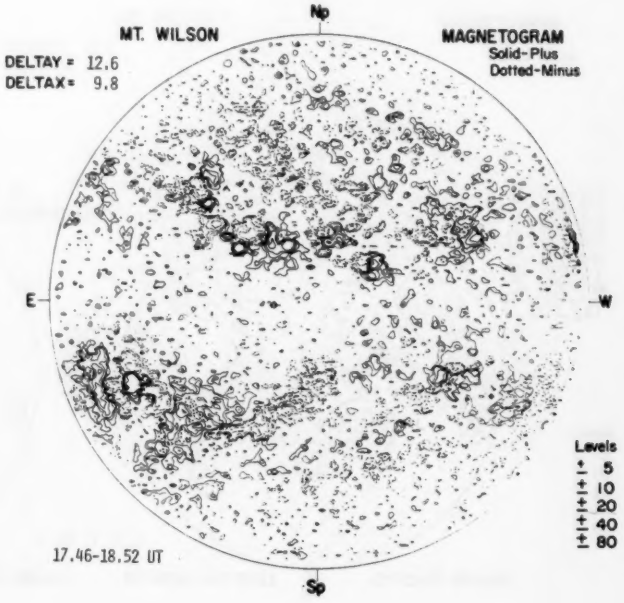
FAIR	M
73- 1800	3.0
78- 1200	2.5
81- 1000	3.0
82- 2400	2.5
84- 2800	2.5
86- 1000	3.0
87- 5000	3.5
90- 0800	3.0

NOVEMBER 30, 1978 (P = 16.63, B_o = 1.01, L_o = 144.35)

SACRAMENTO PEAK

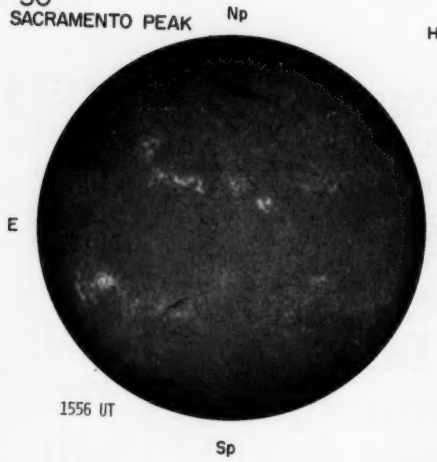




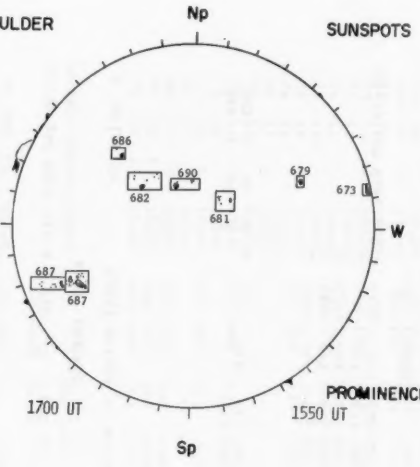


30

SACRAMENTO PEAK



Hα BOULDER



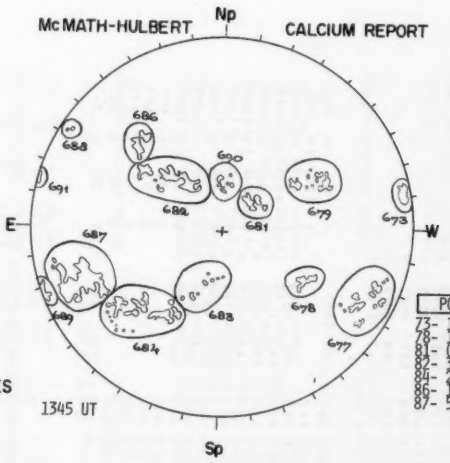
SUNSPOTS

PROMINENCES

1550 UT

McMATH-HULBERT

CALCIUM REPORT



POOR	M
73- 1800-3.0	
78- 1000-2.5	
81- 0700-3.0	
82- 3000-3.5	
84- 2800-2.5	
86- 1000-2.5	
87- 5400-3.5	

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MCMATH REGION 15631 CMP DATE 1.9 RETURN OF REGION 15570 ROTATION 3

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	10	26	15631	S15 E88	149	2000	2.5	20280	S14 E75	163	(BF)	3				
78	10	27	15631	S13 E67	158	2200	2.0	20280	S13 E63	156	(AP)	3				
78	10	28	15631	S13 E55	157	2000	2.5	20280	S13 E53	159	(AP)	3				
78	10	29	15631	S13 E42	156	2200	3.0	20280	S13 E40	158	(BP)	4				
78	10		15631					20286	S12 E51	147	(B)	2				
78	10	30	15631	S14 E30	155	2900	3.0									
78	10	31	15631	S14 E17	156	2900	3.5									
78	11	1	15631	S14 E05	154	2900	3.0		S13 W03				B	50	4	CSO
78	11		15631						S12 E12				B	100	15	DAI
78	11	2	15631	S14 W09	154	2500	3.5	20280	S15 W13	157	(AP)	4	B	80	6	CSO
78	11		15631					20286	S11 W03	147	(B)	4	B	100	11	DAO
78	11	3	15631	S14 W22	154	2500	3.0	20280	S14 W25	156	(AP)	4	B	60	1	HSX
78	11		15631					20286	S11 W17	148	(BP)	4	B	50	15	DSO
78	11		15631					20295	S12 W33	164	(B)	3	B	30	9	CRO
78	11	4	15631	S14 W36	155	2500	3.0	20280	S14 W41	158	(AP)	3	B	50	1	HSX
78	11		15631					20286	S11 W31	148	(AP)	2	B	40	3	HSX
78	11		15631					20295	S11 W49	166	(B)	2	B	10	3	BXO
78	11	5	15631	S14 W50	155	2500	3.0		S12 W46				B	20	4	HRX
78	11		15631						S15 W54				B	20	1	HRX
78	11	6	15631						S13 W56				B	40	1	AXX
78	11		15631						S16 W67				B	50	1	HSX
78	11	7	15631	S14 W76	155	2300	2.5	20280	S14 W78	156	AP	3	B	20	1	HSX
78	11	8	15631	S14 W89	155	1200	1.0									

MCMATH REGION 15629 CMP DATE 2.3 RETURN OF REGIONS 15576 AND 15577 ROTATION 2

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	10	26	15629	N29 E85	152	900	2.0	20281	N28 E85	153	AP	3				
78	10	27	15629	N29 E72	153	800	1.5	20281	N29 E75	149	(AP)	3				
78	10	28	15629	N30 E60	152	600	2.0	20281	N29 E57	155	(AP)	3				
78	10	29	15629	N30 E46	152	800	2.0	20281	N29 E44	154	(AP)	2				
78	10	30	15629	N31 E34	151	1100	2.0									
78	10	31	15629	N31 E22	151	1100	2.0									
78	11	1	15629	N31 E10	149	1000	1.5									
78	11	2	15629	N30 E00	145	1000	1.5	20292	N27 E04	140	(B)	3	B	20	4	CRO
78	11	3	15629	N30 W12	144	1100	1.5		N26 W11				B	10	1	AXX
78	11	4	15629	N30 W25	144	1000	1.5									
78	11	5	15629	N30 W36	141	1000	1.5									
78	11	7	15629	N30 W62	141	700	1.0									

MCMATH REGION 15630 CMP DATE 2.3 RETURN OF REGION 15569 ROTATION 2

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	10	26	15630	N14 E88	149	600	1.5									
78	10	27	15630	N16 E76	149	800	1.5									
78	10	28	15630	N16 E63	149	600	2.0									
78	10	29	15630	N16 E50	148	600	2.0									
78	10	30	15630	N16 E36	149	600	2.0									
78	10	31	15630	N16 E22	151	600	2.0									
78	11	1	15630	N16 E09	150	1000	2.0		N14 W01				B	30	6	CRO
78	11	2	15630	N16 W06	151	1400	3.0	20291	N13 W17	161	(B)	3	B	70	17	DAI
78	11	3	15630	N16 W20	152	1600	3.0	20291	N13 W30	161	(B)	3	B	70	13	DRO
78	11		15630					20296	N12 W15	146	(AP)	3	B	10	1	AXX
78	11	4	15630	N16 W33	152	1600	3.0	20291	N14 W45	162	(B)	2	B	20	7	CRO
78	11	5	15630	N16 W45	150	1700	3.0									
78	11	7	15630	N16 W72	151	1800	2.0									

MCMATH REGION 15632 CMP DATE 3.0

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	10	28	15632	N08 E70	142	100	1.5									
78	10	29	15632	N08 E57	141	100	1.5									
78	10	30	15632	N09 E44	141	100	1.0									

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MCMATH REGION 15650 CMP DATE 3.3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	8	15650	N05 W70	136	100	1.0									

MCMATH REGION 15636 CMP DATE 4.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	10	30	15636	N07 E65	120	100	2.0									
78	10	31	15636	N07 E52	121	300	2.0									
78	11	1	15636	N07 E37	122	300	1.5		N06 E33				B	10	1	HRX
78	11	2	15636	N07 E22	123	100	1.0									
78	11	3	15636	N07 E08	124	100	1.0									
78	11	4	15636	N07 W04	123	300	1.5									
78	11	5	15636	N07 W18	123	200	1.0									

MCMATH REGION 15635 CMP DATE 4.7 RETURN OF REGION 15582 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	10	29	15635	S22 E79	113	1800	2.5	20287	S22 E71	127	(B)	2				
78	10	30	15635	S24 E70	115	4000	2.5									
78	10	31	15635	S24 E58	115	4700	3.0									
78	11	1	15635	S24 E45	114	5600	3.5		S24 E37				B	210	10	EAI
78	11	2	15635	S24 E31	114	6000	4.0	20287	S20 E19	125	(BY)	4	B	180	24	DAI
78	11		15635					20293	S25 E23	116	(BY)	3	B	260	33	FAI
78	11	3	15635	S24 E17	115	6500	3.5	20287	S20 E06	125	(BY)	5	B	250	23	DKI
78	11		15635					20293	S24 E17	114	(BY)	3	B	280	59	FSI
78	11	4	15635	S24 E02	117	6500	3.0	20287	S19 W10	127	(BY)	4	B	140	10	DSI
78	11		15635					20293	S24 E02	115	(B)	3	B	90	31	FSI
78	11	5	15635	S23 W10	115	6500	3.0		S19 W22				B	200	15	DAI
78	11		15635						S25 W10				B	70	21	FSI
78	11	6	15635						S25 W23				B	80	8	BXO
78	11		15635						S19 W35				B	170	7	DAI
78	11	7	15635	S24 W36	115	6600	3.0	20287	S19 W47	125	(B)	3	B	120	14	DSI
78	11		15635						S24 W35				B	30	5	BXO
78	11	8	15635	S24 W50	116	7000	3.0	20287	S19 W58	123	(B)	1	B	50	5	BXI
78	11		15635					20303	S24 W45	110	(AF)	2				
78	11	9	15635	S25 W62	115	7000	3.0	20305	S26 W58	109	AF	3				
78	11	10	15635	S26 W75	115	5500	3.0		S24 W75				M	30	2	BXO
78	11	11	15635	S26 W88	114	2000	1.0									

MCMATH REGION 15645 CMP DATE 6.4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	5	15645	S21 E11	94	400	2.5		S22 E09				B	10	3	BXO
78	11	6	15645						S21 W03				B	80	8	BXI
78	11	7	15645	S22 W15	94	1000	2.5	20299	S22 W17	95	(B)	3	B	70	7	CRO
78	11	8	15645	S22 W28	94	1000	2.5	20299	S23 W29	94	(AP)	2	B	40	2	CSO
78	11	9	15645	S23 W40	93	900	2.5									
78	11	10	15645	S23 W53	93	900	2.5									
78	11	11	15645	S23 W66	92	600	1.5									

MCMATH REGION 15656 CMP DATE 7.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	11	15656	N24 W58	84	100	1.5									

MCMATH REGION 15641 CMP DATE 7.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	2	15641	S13 E70	75	900	3.5	20294	S13 E65	79	(AP)	3	B	20	3	CSO
78	11	3	15641	S13 E56	76	1300	3.5	20294	S12 E55	76	(B)	4	B	240	18	DSC
78	11	4	15641	S13 E42	77	2000	3.5	20294	S12 E39	78	(B)	5	B	720	21	EHI
78	11	5	15641	S13 E28	77	3000	3.0		S12 E25				B	650	26	EHO
78	11	6	15641						S11 E12				B	740	16	FKI

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MCMATH REGION 15641 (CONT) CMP DATE 7.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	7	15641	S13 E04	75	3400	3.0	20294	S11 W01	79	(B)	4	B	630	32	EKI
78	11	8	15641	S13 W10	76	3600	3.5	20294	S11 W13	78	(BY)	4	B	730	31	FKI
78	11	9	15641	S14 W23	76	4000	3.5	20294	S12 W28	79	(BY)	4	B	790	39	FKI
78	11	10	15641	S14 W36	76	4000	3.5		S12 W28				M	870	40	FKI
78	11	11	15641	S14 W51	77	4000	3.5		S12 W40				M	870	35	FKC
78	11	12	15641						S12 W58				M	940	24	FKI
78	11	13	15641						S14 W79				B	460	11	FKI
78	11	14	15641	S12 W88	76	500	1.0									

MCMATH REGION 15655 CMP DATE 8.3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	10	15655	N19 W30	70	100	1.5		N24 W34				M	10	1	AXX
78	11	11	15655	N19 W44	70	100	1.5									

MCMATH REGION 15639 CMP DATE 8.5 RETURN OF REGION 15580 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	2	15639	N37 E73	72	600	1.0									
78	11	3	15639	N37 E60	72	600	1.0									
78	11	4	15639	N37 E47	72	800	1.5									
78	11	5	15639	N38 E32	73	800	1.0									
78	11	7	15639	N38 E13	66	600	1.5									
78	11	8	15639	N38 E02	64	400	1.5									
78	11	9	15639	N37 W10	63	300	1.0		N24 W30							
78	11	10	15639	N37 W23	63	300	1.0									
78	11	11	15639	N36 W37	63	400	1.5									

MCMATH REGION 15642 CMP DATE 9.7 RETURN OF REGION 15587 ROTATIONS 3 AND 4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	3	15642	S21 E82	50	500	1.0									
78	11	4	15642	S22 E72	47	1200	2.0									
78	11	5	15642	S22 E52	53	1800	2.5									
78	11	7	15642	S22 E28	51	1900	2.5									
78	11	8	15642	S22 E15	51	2200	2.5	20304	S18 E22	43	(B)	2	B	20	4	BXO
78	11	9	15642	S22 E02	51	2200	2.5	20304	S19 E05	46	(AP)	2	B	10	1	AXX
78	11	10	15642	S22 W14	54	2000	2.0									
78	11	11	15642	S23 W26	52	2100	2.0									
78	11	14	15642	S22 W57	45	2000	2.0									
78	11	15	15642	S22 W72	43	1700	2.0									
78	11	16	15642	S23 W82	44	800	1.0									

MCMATH REGION 15643 CMP DATE 10.5 RETURN OF REGION 15589 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	3	15643	N17 E87	45	800	2.0	20297	N17 E80	51	AP	5	B	250	2	HHX
78	11	4	15643	N18 E80	39	3000	3.5	20297	N16 E68	49	(BP)	5	B	470	3	CHO
78	11	5	15643	N18 E62	43	3500	3.5		N17 E62				B	560	3	FHO
78	11	6	15643						N19 E48				B	460	3	EHO
78	11	7	15643	N19 E38	41	4500	3.0	20297	N17 E29	49	(BP)	5	B	390	11	FHO
78	11		15643					20300	N18 E41	37	(AP)	3				
78	11	8	15643	N20 E26	40	4500	3.5	20297	N18 E17	48	(BY)	5	B	430	17	DHI
78	11		15643					20300	N20 E27	38	(AP)	4	B	30	1	HSX
78	11	9	15643	N20 E13	40	4300	3.5	20297	N20 E07	44	(BP)	4	B	560	17	EHI
78	11	10	15643	N20 W01	41	4300	3.5		N19 E04				M	460	27	EHI
78	11	11	15643	N19 W15	41	4400	3.0		N19 W08				M	400	29	EHI
78	11	13	15643						N18 W49				B	640	15	EKI
78	11	14	15643	N20 W60	48	4100	3.0	20297	N18 W63	50	(BP)	3	M	620	11	EHI
78	11	15	15643	N19 W75	46	2700	3.0	20297	N20 W74	48	BP	4	B	240	5	ESO
78	11	16	15643	N20 W85	47	2100	3.0		N21 W88				B	10	1	HRX

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MCMATH REGION 15646 CMP DATE 11.6 RETURN OF PART OF REGION 15591 ROTATION 2

			CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	5	15646	S20 E78	27	500	1.0									
78	11	7	15646	S20 E53	26	700	2.0									
78	11	8	15646	S20 E40	26	500	1.5									
78	11	9	15646	S20 E27	26	500	1.5									
78	11	10	15646	S20 E14	26	400	1.0									
78	11	11	15646	S20 E00	26	300	1.0									

MCMATH REGION 15648 CMP DATE 12.0

			CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	7	15648	N17 E60	19	200	1.0									
78	11	8	15648	N17 E48	18	300	1.0									
78	11	9	15648	N17 E34	19	200	1.0									
78	11	10	15648	N17 E19	21	100	1.0									

MCMATH REGION 15647 CMP DATE 13.2 RETURN OF PART OF REGION 15591 ROTATION 2

			CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	7	15647	S23 E74	5	2500	2.5	20301	S22 E68	10	(AP)	3	B	120	2	CSO
78	11	8	15647	S24 E62	4	2800	2.0	20301	S19 E54	11	(AP)	4	B	130	1	HHX
78	11	9	15647	S24 E50	3	2100	2.0	20301	S21 E43	8	(AP)	4	B	170	1	HHX
78	11	10	15647	S24 E37	3	2100	2.0		S20 E40				M	110	1	HSX
78	11	11	15647	S24 E24	2	1700	2.0		S20 E28				M	110	1	HSX
78	11	12	15647						S20 E13				M	140	1	HSX
78	11	13	15647						S20 W09				B	160	1	HHX
78	11	14	15647	S23 W18	6	2000	2.5	20301	S21 W22	9	(BP)	4	M	180	3	CSO
78	11	15	15647	S23 W34	5	1800	2.5	20301	S21 W34	8	(AP)	4	B	190	1	HHX
78	11	16	15647	S23 W44	6	1600	2.5	20301	S21 W47	8	(AP)	4	B	200	4	CHO
78	11	17	15647	S23 W60	4	1300	2.5	20301	S21 W59	6	(AP)	4	B	260	5	HKX
78	11	18	15647					20301	S22 W72	6	(AP)	4	B	200	5	HKX

MCMATH REGION 15660 CMP DATE 13.2

			CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	14	15660	N25 W19	7	500	2.0	20306	N24 W17	4	AP	3	M	10	1	AXX
78	11	15	15660	N25 W36	7	400	2.0									
78	11	16	15660	N25 W46	8	400	2.0									
78	11	17	15660	N25 W62	6	300	1.5									

MCMATH REGION 15649 CMP DATE 14.3

			CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	07	15649					20302	N30 E83	356	AP	3	B	10	1	AXX
78	11	08	15649					20302	N32 E70	356	(AP)	3	B	20	1	HRX
78	11	09	15649	N31 E63	351	200	2.0	20302	N29 E56	356	(AP)	4	B	20	1	HRX

MCMATH REGION 15651 CMP DATE 14.5

			CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	8	15651	N24 E80	347	700	2.0									
78	11	9	15651	N24 E67	347	400	2.0									
78	11	10	15651	N24 E51	350	300	2.5									
78	11	11	15651	N24 E38	349	600	2.5									
78	11	14	15651	N25 W02	350	1000	2.0	20307	N24 W03	350	(B)	4	M	80	7	DSO
78	11	15	15651	N24 W18	349	1400	2.5	20307	N24 W16	350	(B)	3	B	140	18	DAI
78	11	16	15651	N24 W27	349	1600	3.0	20307	N24 W28	349	(B)	4	B	130	11	DAI
78	11	17	15651	N24 W44	348	1600	3.0	20307	N23 W42	349	(B)	4	B	120	11	CAO
78	11	18	15651					20307	N22 W53	347	(BP)	4	B	200	14	EAO
78	11		15651					20316	N22 W46	340	(B)	3				
78	11	19	15651	N24 W65	347	1600	3.0	20307	N22 W69	350	(AP)	4	B	120	4	CAO
78	11		15651					20316	N22 W60	341	(B)	3				
78	11	20	15651						N24 W78				R	120	3	CSO

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MCMATH REGION 15671 CMP DATE 14.9

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	16	15671	S17 W22	344	100	2.0	20310	S18 W22	343	B	1	B	10	2	BXO
78	11	17	15671	S17 W39	343	1200	2.5	20310	S17 W37	344	(BP)	3	B	50	8	CRO
78	11	18	15671					20310	S17 W53	347	(AP)	3	B	20	2	AXX
78	11	19	15671	S17 W61	343	700	2.5	20310	S17 W66	347	(AP)	3				

MCMATH REGION 15657 CMP DATE 15.4 RETURN OF REGION 15601 ROTATION 3

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	10	15657	S31 E66	335	200	1.0									
78	11	11	15657	S31 E50	337	200	1.0									
78	11	14	15657	S32 E10	338	200	1.0									
78	11	15	15657	S31 W05	336	100	1.0									
78	11	16	15657	S31 W15	337	100	1.5									
78	11	17	15657	S31 W30	334	100	1.5									
78	11	19	15657	S31 W51	333	200	1.0									

MCMATH REGION 15652 CMP DATE 15.8 RETURN OF REGION 15617 ROTATION 2

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	9	15652	N15 E88	326	300	1.0									
78	11	10	15652	N14 E72	329	500	1.5									
78	11	11	15652	N14 E55	332	200	1.0									

MCMATH REGION 15654 CMP DATE 15.8

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	9	15654	S20 E86	328	900	2.5									
78	11	10	15654	S20 E73	328	1100	2.0									
78	11	11	15654	S20 E56	331	1300	2.0									
78	11	12	15654						S19 E47				M	10	3	BXO
78	11	14	15654	S18 E15	333	1300	2.0	20308	S18 E14	333	(AP)	2	M	0	1	AXX
78	11	15	15654	S18 W01	332	1000	2.0									
78	11	16	15654	S18 W12	334	600	2.0	20312	S18 W13	334	(AP)	1	B	10	1	AXX
78	11	17	15654	S18 W29	333	700	2.0		S17 W27				B	20	3	BXO
78	11	18	15654					20317	S18 W37	331	(B)	3	B	40	5	BXO
78	11	19	15654	S18 W50	332	1000	2.5	20317	S19 W47	328	(B)	2				
78	11	20	15654						S17 W60				R	10	1	AXX

MCMATH REGION 15665 CMP DATE 15.9

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	15	15665	N11 E01	330	200	2.0		N10 E05				B	10	6	BXO
78	11	16	15665	N11 W09	331	300	2.5	20311	N12 W09	330	(AP)	2	B	20	4	CRO
78	11	17	15665	N11 W25	329	500	2.5	20311	N10 W24	331	(AP)	3	B	30	4	BXO
78	11	19	15665	N13 W50	332	800	2.0									

MCMATH REGION 15653 CMP DATE 16.0 RETURN OF REGION 15592 ROTATIONS 3 AND 1

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	9	15653	N34 E88	326	300	1.0									
78	11	10	15653	N37 E74	327	600	1.0									
78	11	11	15653	N37 E57	330	900	1.0									
78	11	13	15653						N39 E35				B	20	3	BXO
78	11	14	15653	N38 E17	331	800	2.0									
78	11	15	15653	N38 E02	329	600	1.5									
78	11	16	15653	N39 W07	329	500	1.5									
78	11	17	15653	N39 W23	327	700	1.0									
78	11	19	15653	N40 W44	326	1700	3.5	20319	N39 W41	322	(BP)	4	B	50	2	CRO
78	11	20	15653					20319	N38 W51	319	(AP)	3	R	90	14	CSO
78	11	21	15653						N38 W70				B	100	5	CSO
78	11	22	15653						N38 W82				B	60	3	CSO

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MCMATH REGION 15659 CMP DATE 16.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
78	11	11	15659	N09 E60	327	200	1.0								

MCMATH REGION 15666 CMP DATE 17.3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
78	11	15	15666	N27 E19	312	100	1.0								
78	11	16	15666	N27 E09	313	100	1.0								

MCMATH REGION 15661 CMP DATE 17.9 RETURN OF REGION 15599 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
78	11	14	15661	N34 E42	306	200	2.0								
78	11	15	15661	N34 E25	306	100	1.5								
78	11	16	15661	N34 E17	305	200	1.5								
78	11	17	15661	N34 E00	304	200	1.0								
78	11	19	15661	N34 W21	303	200	1.5								

MCMATH REGION 15658 CMP DATE 18.2 RETURN OF REGION 15604 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
78	11	11	15658	S27 E84	303	300	1.0								
78	11	14	15658	S27 E44	304	500	1.5		S28 E38				H	10	2 BXO
78	11	15	15658	S27 E30	301	400	1.5								
78	11	16	15658	S27 E20	302	300	1.5								
78	11	17	15658	S27 E04	300	300	1.0								
78	11	19	15658	S27 W18	300	300	1.0								

MCMATH REGION 15662 CMP DATE 18.5 RETURN OF REGION 15613 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
78	11	14	15662	N16 E51	297	500	2.0								
78	11	15	15662	N16 E35	296	500	1.5								
78	11	16	15662	N16 E25	297	600	1.5								
78	11	17	15662	N16 E08	296	500	1.5								
78	11	19	15662	N16 W13	295	500	2.0								

MCMATH REGION 15663 CMP DATE 20.3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
78	11	14	15663	N17 E80	268	500	2.5	20309	N14 E72	275	AP	3	H	30	1 HRX
78	11	15	15663	N18 E60	271	500	2.5	20309	N14 E59	275	AP	3	B	30	1 HRX
78	11	16	15663	N17 E49	273	700	2.5	20309	N14 E46	275	(AP)	3	B	20	2 HRX
78	11	17	15663	N17 E33	271	700	2.0		N15 E31				B	10	2 AXX
78	11	19	15663	N17 E09	273	500	2.0								
78	11	25	15663	N17 W70	273	400	1.0								

MCMATH REGION 15668 CMP DATE 21.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
78	11	15	15668	S20 E70	261	400	2.5								
78	11	16	15668	S21 E59	263	500	3.0	20313	S23 E57	264	B	3	B	20	5 BXI
78	11	17	15668	S22 E43	261	800	3.0	20313	S22 E43	264	(B)	3	B	90	9 CRO
78	11	18	15668					20313	S24 E32	262	(B)	3	B	30	2 CRO
78	11	19	15668	S22 E22	260	800	3.0	20313	S24 E16	265	(AP)	3	B	20	1 HRX
78	11	20	15668					20313	S25 E04	264	(AP)	2	R	10	4 BXO
78	11	21	15668						S23 W10				B	20	2 BXO
78	11	25	15668	S24 W58	261	700	2.0								

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MCMATH REGION 15676 CMP DATE 21.4

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	19	15676	S30 E24	258	100	1.0
78	11	20	15676				
78	11	21	15676				

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20320	S31 E08	260	(AP)	2	R	10	2	AXX
	S30 W06				B	10	1	AXX

MCMATH REGION 15667 CMP DATE 21.9 RETURN OF REGION 15610 ROTATION 3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	15	15667	N35 E78	253	500	1.5
78	11	16	15667	N34 E66	256	1300	1.5
78	11	17	15667	N34 E50	254	1100	1.5
78	11	19	15667	N34 E28	254	1000	2.0
78	11	25	15667	N34 W49	252	800	1.5

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS

MCMATH REGION 15669 CMP DATE 22.4 RETURN OF REGION 15615 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	15	15669	S16 E85	246	1200	2.5
78	11	16	15669	S16 E76	246	3500	2.5
78	11	17	15669	S16 E62	242	2700	3.0
78	11	18	15669				
78	11	19	15669	S16 E39	243	1800	3.0
78	11	20	15669				
78	11	21	15669				
78	11	22	15669				
78	11	23	15669				
78	11		15669				
78	11	25	15669	S16 W42	245	2000	3.0
78	11	26	15669				
78	11	27	15669				
78	11	28	15669	S18 W78	239	1200	1.5

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20314	S17 E70	251	AP	4	B	130	2	HSX
20314	S18 E59	248	(AP)	4	B	250	3	HHX
20314	S18 E46	248	(AP)	4	B	140	2	HHX
20314	S18 E32	249	(AP)	4	B	130	2	HSX
20314	S18 E19	249	(BP)	4	R	230	6	CKO
	S18 E06				B	180	10	CKO
	S18 W08				B	140	9	DAI
20314	S18 W22	250	(AP)	2	B	50	9	DAC
20322	S12 W23	251	(B)	3	B	20	3	CSO
	S18 W49				M	10	2	BXO
	S18 W60				M	10	2	BXO

MCMATH REGION 15670 CMP DATE 23.2 RETURN OF REGION 15634 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	16	15670	S27 E85	237	900	2.5
78	11	17	15670	S27 E70	234	1300	3.0
78	11	18	15670				
78	11	19	15670	S27 E47	235	1000	3.5
78	11	20	15670				
78	11	21	15670				
78	11	22	15670				
78	11	23	15670				
78	11	24	15670				
78	11	25	15670	S27 W31	234	1000	3.0
78	11	26	15670				
78	11	27	15670				
78	11	28	15670	S27 W71	232	1000	2.0
78	11	29	15670	S28 W83	232	300	1.5

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20315	S27 E77	244	AP	4	B	60	1	HSX
20315	S27 E65	242	(AP)	4	B	130	5	CSO
20315	S28 E53	241	(AP)	4	B	120	1	HSX
20315	S28 E41	240	(AP)	4	B	100	1	HSX
20315	S28 E28	240	(AP)	4	R	140	1	HSX
	S28 E14				B	130	1	HSX
	S28 E02				B	110	1	HSX
20315	S28 W10	238	(AP)	3	B	120	1	HHX
	S28 W25				M	80	1	HSX
20315	S28 W48	237	(AP)	3	M	90	1	HSX
20315	S28 W60	235	(AP)	3	B	70	2	HSX
20315	S30 W73	235	(AP)	2	M	100	1	HSX

MCMATH REGION 15672 CMP DATE 24.2 RETURN OF PARTS OF REGION 15619 ROTATIONS 3 AND 4

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	17	15672	N24 E86	218	600	1.5
78	11	19	15672	N25 E65	217	700	1.5
78	11	25	15672	N26 W18	221	500	2.0
78	11	28	15672	N26 W60	221	600	1.0

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS

MCMATH REGION 15673 CMP DATE 24.5 RETURN OF PARTS OF REGION 15619 ROTATIONS 3 AND 4

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	17	15673	N15 E89	215	400	2.0
78	11	18	15673				

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20318	N14 E78	216	(AP)		B	10	1	AXX

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MCMATH REGION 15673 (CONT) CMP DATE 24.5 RETURN OF REGION 15619 ROTATION 3

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	19	15673	N16 E71	211	1400	2.5	20318	N14 E64	217	(AP)	3	B	10	1	AXX
78	11	20	15673					20318	N15 E51	217	(AP)	3	R	10	1	AXX
78	11	25	15673	N16 W14	217	800	2.5									
78	11	27	15673					20330	N13 W37	212	(B)	4	B	80	20	DAI
78	11	28	15673	N17 W54	215	2000	4.0	20330	N12 W50	212	(B)	5	H	110	15	DSO
78	11	29	15673	N14 W65	214	1800	3.0	20330	N13 W61	210	(B)	4	B	680	11	DHO
78	11	30	15673	N14 W77	214	1800	3.0	20330	N12 W75	211	(B)	4	R	470	3	EKO

MCMATH REGION 15677 CMP DATE 26.3 RETURN OF REGION 15620 ROTATION 2

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	19	15677	S20 E88	194	500	1.0									
78	11	20	15677					20321	S17 E68	200	(AP)	3	R	10	3	AXX
78	11	25	15677	S20 E09	194	2600	2.5									
78	11	21	15677						S17 E55				B	30	1	HRX
78	11	22	15677						S17 E40				B	10	2	BXO
78	11	26	15677						S18 W06				H	10	2	BXO
78	11	28	15677	S20 W30	191	2000	2.0									
78	11	29	15677	S20 W44	193	2800	2.0									
78	11	30	15677	S20 W57	194	2500	2.0									

MCMATH REGION 15692 CMP DATE 28.1

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	12	01	15692					20336	S26 W33		(B)	2	B	30	4	C
78	12	02	15692					20336	S26 W44		(AP)	3	B	40	8	C
78	12	03	15692					20336	S28 W58		(AP)	3	B	30	4	C
78	12	04	15692	S27 W72		400	3.0		S27 W77				B	40	3	C

MCMATH REGION 15678 CMP DATE 28.3 RETURN OF REGION 15631 ROTATION 4

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	25	15678	S13 E35	168	800	2.0									
78	11	26	15678					20324	S13 E24	165	(B)	2	H	50	6	CRO
78	11	27	15678					20331	S15 E13	162	(AF)	2	B	20	3	BXO
78	11	28	15678	S13 W05	166	1000	2.5	20331	S14 W02	164	(B)	3	H	60	7	CRO
78	11	29	15678	S14 W16	165	1200	2.5	20331	S13 W15	164	(BF)	2	B	20	3	CRO
78	11	30	15678	S14 W28	165	1000	2.5		S14 W29				R	10	2	AXX
78	12	04	15678	S15 W85		300	1.0									

MCMATH REGION 15693 CMP DATE 28.4

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	12	04	15693	S10 W66		300	1.5									
78	12	05	15693	S11 W79		300	2.0									

MCMATH REGION 15679 CMP DATE 28.5 RETURN OF REGION 15630 ROTATION 3

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	23	15679					20323	N15 E57	171	AP	4	B	60	1	HSX
78	11	25	15679	N15 E38	165	2000	3.0									
78	11	26	15679					20323	N15 E17	172	(AP)	4	H	50	4	CSO
78	11	27	15679					20323	N15 E04	171	(AP)	4	B	80	5	HSX
78	11	28	15679	N15 W03	164	1200	2.0	20323	N14 W10	172	(AP)	4	H	50	3	CSO
78	11	29	15679	N15 W16	165	2000	2.0	20323	N15 W23	172	(AP)	4	B	70	1	HHX
78	11	30	15679	N15 W29	166	1700	2.0	20323	N14 W36	172	(AP)	4	R	110	5	CSO
78	12	01	15679					20323	N14 W48		(AP)	4				
78	12	02	15679					20323	N14 W62		(AP)	3				
78	12	03	15679					20323	N13 W78		(AP)	3				

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1978

MCMATH REGION 15680 CMP DATE 29.5 RETURN OF REMNANTS OF REGION 15629 ROTATION 3

				CALCIUM	PLAGE	DATA		SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	25	15680	N25 E51	152	900	2.5									
78	11	28	15680	N25 E11	150	400	1.0									
78	11	29	15680	N26 E00	149	300	1.0									

MCMATH REGION 15681 CMP DATE 29.9

				CALCIUM	PLAGE	DATA		SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	25	15681	N10 E60	143	1100	3.5									
78	11	26	15681					20325	N08 E45	144	(B)	2	M	70	9	DRO
78	11	27	15681					20325	N08 E31	144	(B)	2	B	70	8	DAO
78	11	28	15681	N10 E16	145	800	2.5	20325	N09 E17	145	(B)	3				
78	11	29	15681	N10 E03	146	1000	3.0	20325	N08 E04	145	(B)	4	B	20	3	CRO
78	11	30	15681	N10 W10	147	700	3.0	20325	N09 W08	144	(AP)	3	R	30	4	CRO
78	12	01	15681					20325	N09 W23		(B)	3				
78	12	04	15681	N09 W64		800	2.5									
78	12	05	15681	N09 W77		600	2.5									

MCMATH REGION 15690 CMP DATE 30.6

				CALCIUM	PLAGE	DATA		SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	25	15690	N14 E67	136	800	3.0									
78	11	26	15690						N15 E54				M	70	1	HSX
78	11	27	15690						N14 E46				B	90	1	HSX
78	11	28	15690	N14 E25	136	700	2.5		N10 E27				M	60	9	DRO
78	11	29	15690	N14 E13	136	800	3.0		N11 E20				B	120	1	HSX
78	11	30	15690	N14 E00	137	300	2.0									

MCMATH REGION 15683 CMP DATE 30.9

				CALCIUM	PLAGE	DATA		SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	25	15683	S13 E68	135	500	1.0									
78	11	28	15683	S14 E28	133	600	1.5									
78	11	29	15683	S15 E16	133	700	1.5									
78	11	30	15683	S16 E04	133	400	1.5									
78	12	04	15683	S16 W49		700	1.5									
78	12	05	15683	S16 W63		700	1.5									
78	12	06	15683	S16 W76		700	1.0									

NOTE: NO CALCIUM SPECTROHELIOGRAMS WERE SECURED AT THE MCMATH-HULBERT OBSERVATORY ON NOV. 6,12,13,18,20,21,22,23,24, 26, AND 27, 1978.
NO SUNSPOT OBSERVATIONS WERE MADE AT MT. WILSON ON NOV. 1,5,6,10,11,12,13,21,22,24, AND 25,1978.

DAILY CALCIUM PLAGE INDEX

NOVEMBER 1978

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
78	11	1	46.2	78	11	11	30.9	78	11	21	*
78	11	2	46.6	78	11	12	*	78	11	22	*
78	11	3	41.8	78	11	13	*	78	11	23	*
78	11	4	39.9	78	11	14	19.7	78	11	24	*
78	11	5	45.0	78	11	15	15.1	78	11	25	27.2
78	11	6	*	78	11	16	15.8	78	11	26	*
78	11	7	45.8	78	11	17	19.1	78	11	27	*
78	11	8	48.0	78	11	18	*	78	11	28	29.5
78	11	9	45.3	78	11	19	21.7	78	11	29	39.9
78	11	10	38.4	78	11	20	*	78	11	30	40.2

* NO OBSERVATIONS

ERRATA: McMath Region 15626, which passed CMP on 31.8 October 1978, was the return of part of Region 15557, rotation 3. This Region information appears in SGD 412 Part I, page 114, December 1978.

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 1978

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
01	0338	0500	0405	1-	1				1				0338	15631
01	1330	1515	1355	1-	5			4	2		5		1329	15619
01	2127	2306U	2159	1-	1				1				*	
02	0231	0306	0237	1-	1				1				0221	15620
02	0629	0737	0645	1-	1				1				0627	X-RAY
02	1058	1145	1106	1-	5			2	1		1		1057	15641
02	1404	1500	1442	1-	5				2	1	2		1401	15635
02	2004	2040	2010	1-	3						3		2002	X-RAY
03	0007	0216	0034	1+	5	1		1		1	1		0003	15631
03	1723	1817	1728	1-	5						6		1722	X-RAY
03	2214	2246	2221	1-	1				1				2213	X-RAY
03	2253	0004	2305	1-	1				1				2253	X-RAY
04	0140	0220	0150	1-	1				1				*	
05	1515	1545	1525	1-	5			1	1		5		1512	15634
05	1915	2000	1926	1-	5						6		1913	15643
06	1225	1300	1231	1+	5				1	1	2		1225E	15642
06	2326	0028	2341	1-	1				1				2330	15641
07	0812	0830	0816	1-	1						1		0811	15641
07	1620	1712	1-	5				1		1	4		1618E	15643
08	1221	1310	1240	1-	1			1					1218	15642
08	1651	1717	1702	1-	5			1	1	1	8		1649	15641
08	1751	1813	1757	1-	5				1	1	7		1751	15643
10	0045	0242	0126	2-	3	1			1		1		0048E	15643
10	1400	1505	1408	1+	5	1	1	5	3		10		1359	15641
10	1732	1800	1748	1-	5	1		1			8		1727	15643
10	1940	2012	1953	1-	5				1		4		1940	15641
11	0355	0424	0403	1-	1				1				0355	X-RAY
11	0858	0909	0902	1	3			2	2				0840	15643
11	1029	1040	1031	1	5	1	1	1	3		2		1029	15643
11	1415	1450	1419	1-	5				1		5		1414	15643
12	1338	1405	1345	1-	1				1		1		1334	X-RAY
13	0409	0511	0419	1-	1				1				0408	X-RAY
13	0822	0843	0841	2	5			1	4		1		0826	15643
13	0923	0935	0928	1-	1				1				0923	15643
13	0958	1028	1005	1-	5				2		1		0956	15643
13	1351	1428	1356	1-	3			2					1350	15643
13	2159	2220U	2224	1-	1				1				*	
15	1037	1044D	1044	1-	5			2	1		1		1039	15643
15	1926	2004	1937	1-	5				1	1	5		1925	15643
15	2321	0002	2327	1-	1				1				2320	X-RAY
16	0815	0835	0821	1-	5			1	2		1		0815	15643
16	1810	1824	1915	1-	5				1	1	3		1808	15651
20	0944	1023	0949	1-	5				4		1		0945	15653
24	2220	0103	2254	1-	1				1				2218	X-RAY
25	1415	1522	1434	1-	1				1		1		1412	X-RAY
27	1142	1216	1150	1-	1			1					*	
27	1408	1510	1419	1-	5				2		1		*	
27	1613	1820	1630	1	3			1			3		*	
28	0248	0407	0303	1-	1				1				0256E	15673
28	0514	0746	0556	1-	3	1			1				0513	15673
28	0806	0903	0814	1-	3				2				0807	X-RAY
28	1025	1205	1030	1	5	1		3	3		1		1023	X-RAY
29	0504	0833	0526	1-	3	1			1				0505	15682
30	0113	0234	0201	1-	1				1				0114	X-RAY
30	0151	0400	0208	1+	5	1		1	1		1		0147	15682
30	0635	0738	0642	1-	1				1				0640E	15687

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 1978

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION	DATE	TIME (UT) and STATION
01-03	0000-2400 A3	15	0000-1816 TM
01-02	0000-2400 A45	16	0630-1310 UM (16 kHz)
04	0000-2400 A3	21	1005-1330 UM (16 kHz)
06	0000-2400 A3	23-25	0000-2400 A45
07-09	0000-2400 A45	26	0900-1800 UM (13 kHz), 0900-1800 UM (16 kHz)
09	1200-1430 UM (13 kHz)	27-30	0000-2400 A3
11-25	0000-2400 A3	28	0000-2400 TN, 1005-1350 UM (16 kHz),
11	0548-1555 TM		1510-2400 UM (16 kHz)
12-29	0000-2400 A28	29	0000-1823 UM (16 kHz), 1300-2000 UM (13 kHz),
14	1000-1400 UM (16 kHz), 2315-2400 TM		1300-2000 UM (16 kHz)

STATIONS REPORTING FOR NOVEMBER 1978

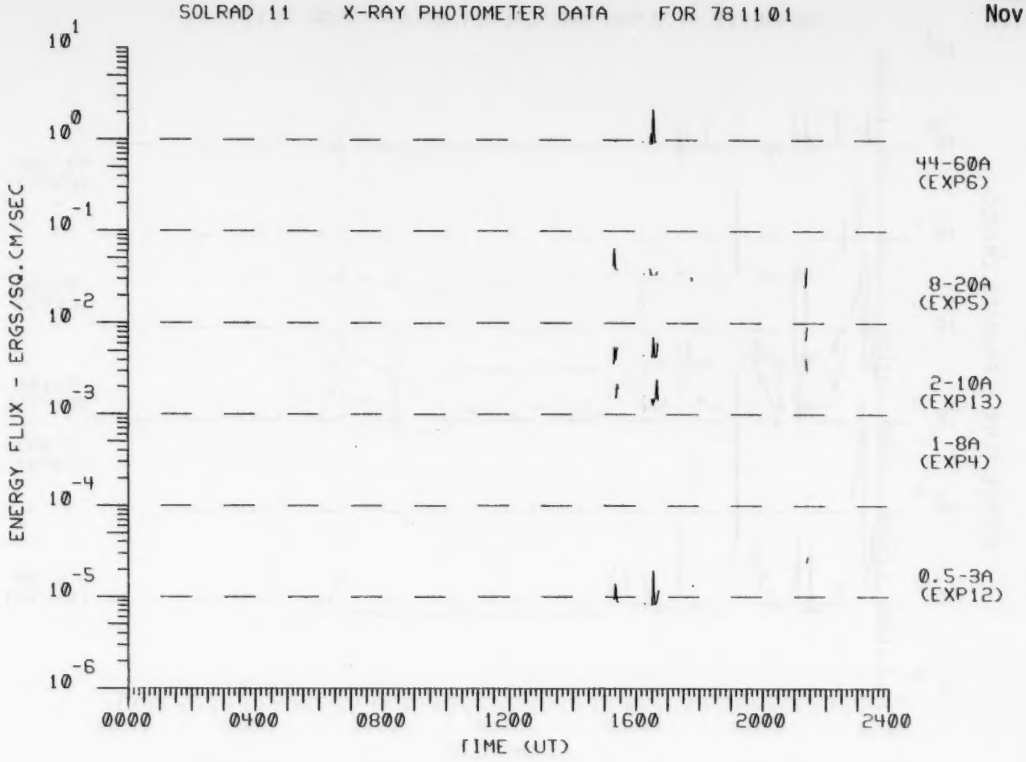
AAVSO (A1, A3, A19, A26, A28, A31, A40, A45, A46) (SES) (A1, A31) (SEA)
CHILWORTH (CL) (SCNA)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
INUBO (IN) (SPA)
JULIUSRUH (SWF)
KUHLUNGSBORN (KU) (SEA, SPA)
MC MATH (MC) (SWF, SCNA)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
UPICE (UI) (SEA)
VSETIN (VS) (SEA)

SIDs BY McMATH REGION

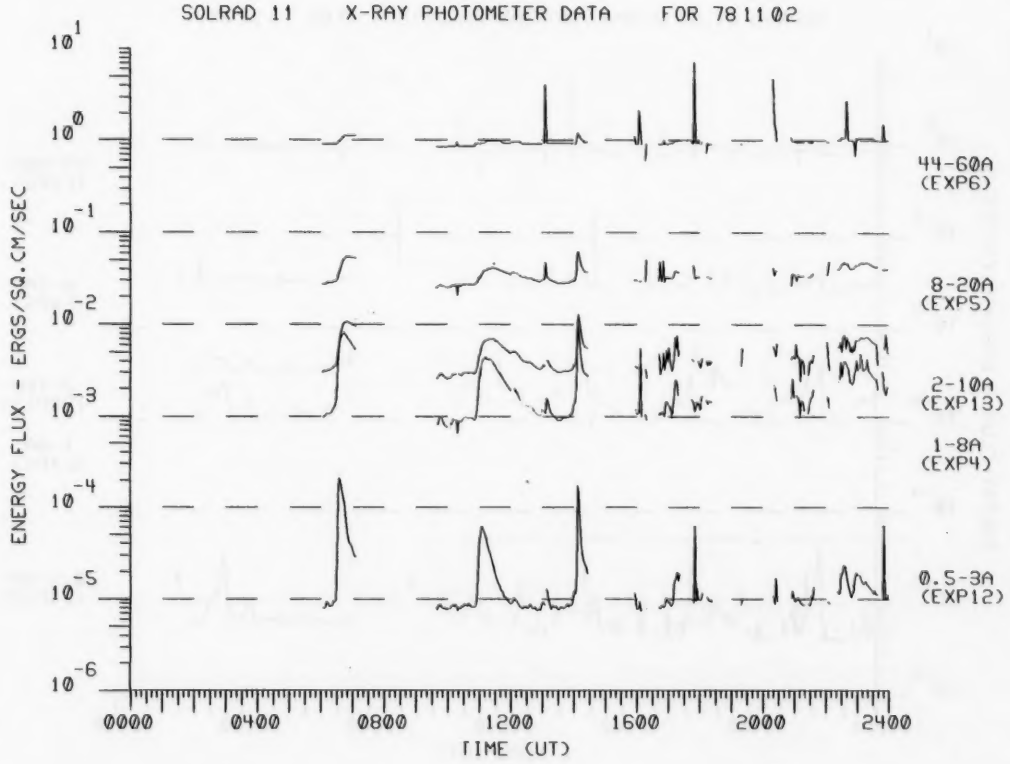
NOVEMBER 1978

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
REGION																														
15619	1																													
15620		1																												
15631	1		1																											
15634					1																									
15635		1																												
15641		1				1	1	1		2																				
15642						1		1																						
15643					1		1	1		2	3		4		2	1														
15651																1														
15653																				1										
15673																												2		
15682																													1	1
15687																														1
X-RAY		2	3								1	1	1		1									1	1			2		1
UNKNOWN																														
NO FP	1			1									1														3			

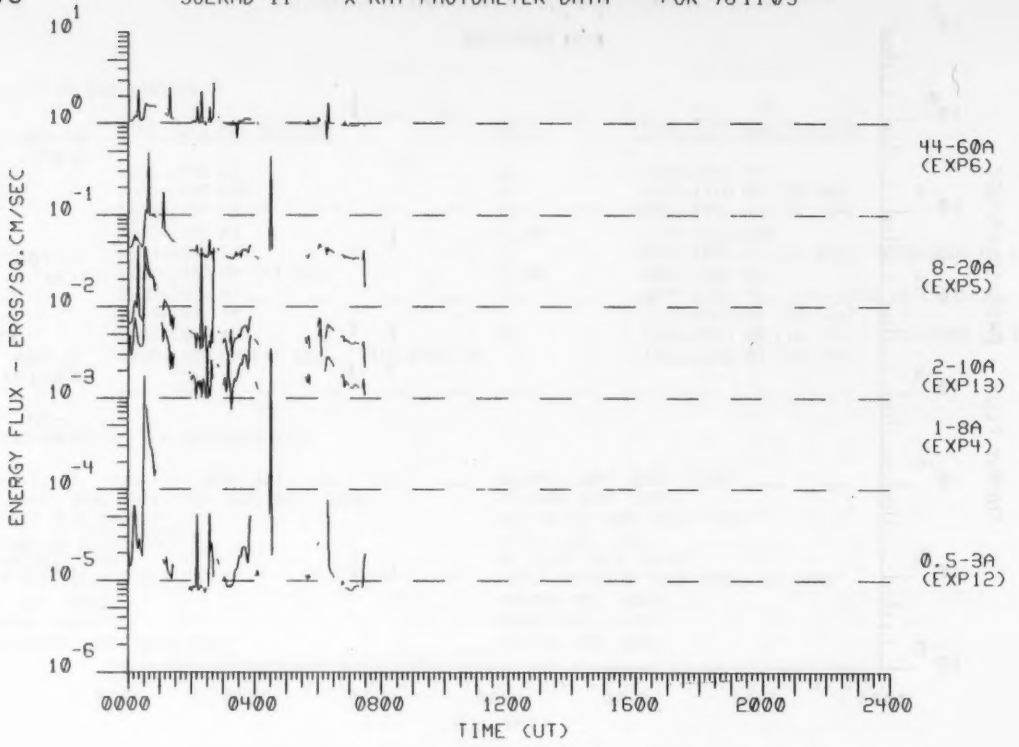
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781101



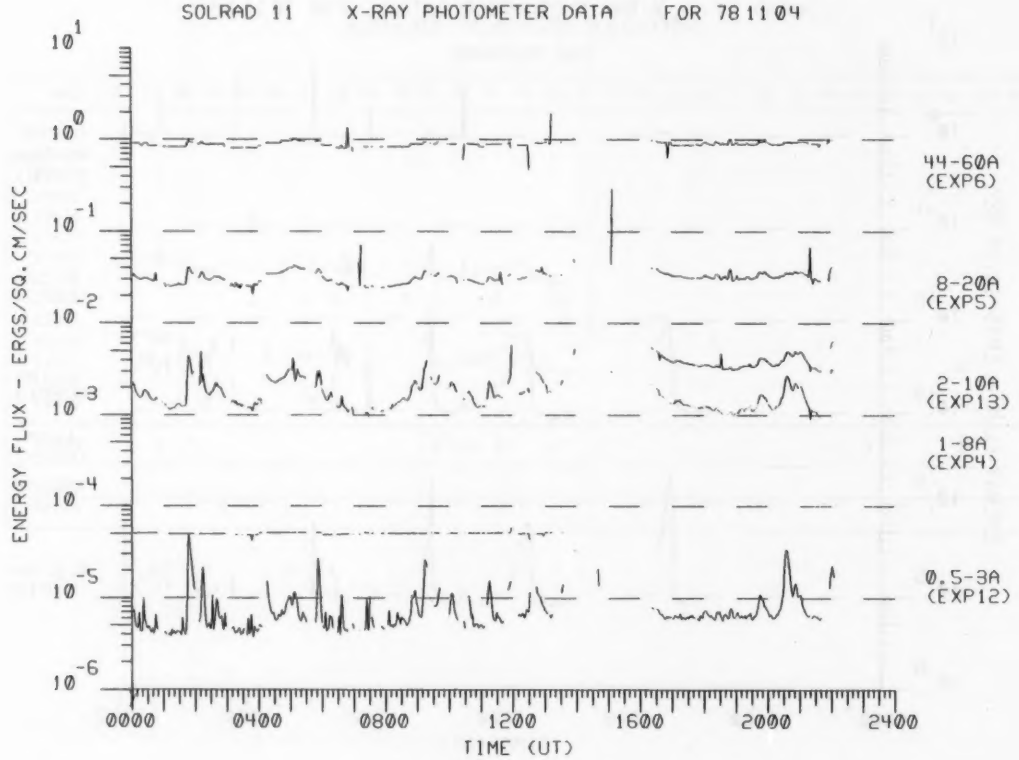
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781102



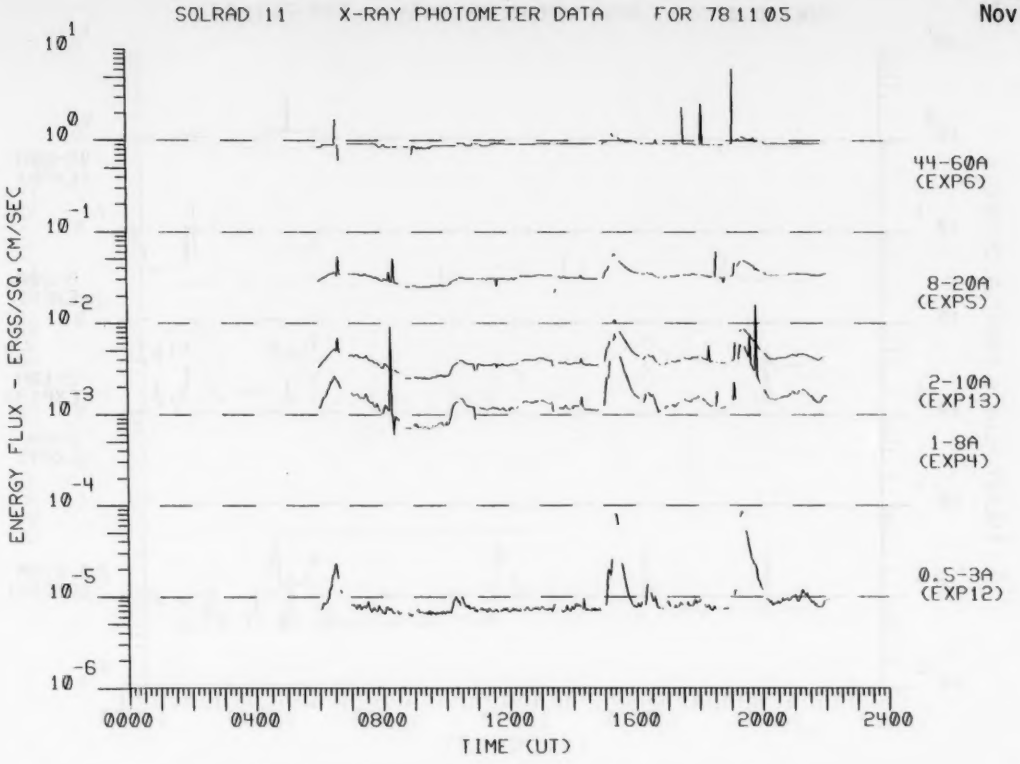
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781103



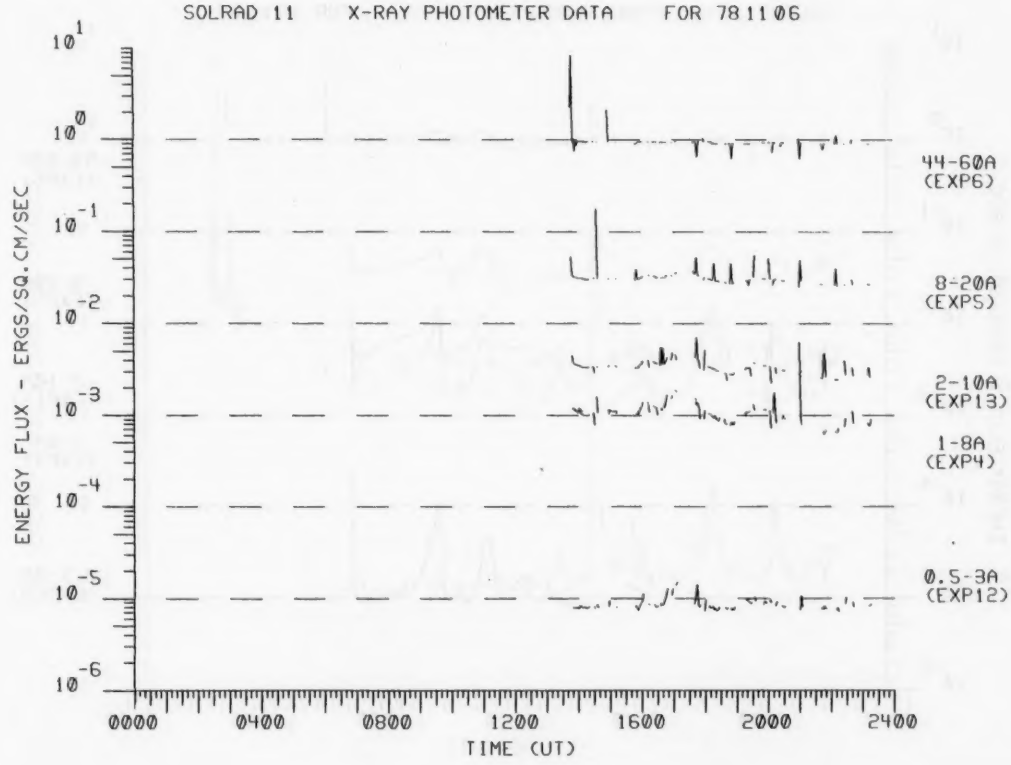
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781104



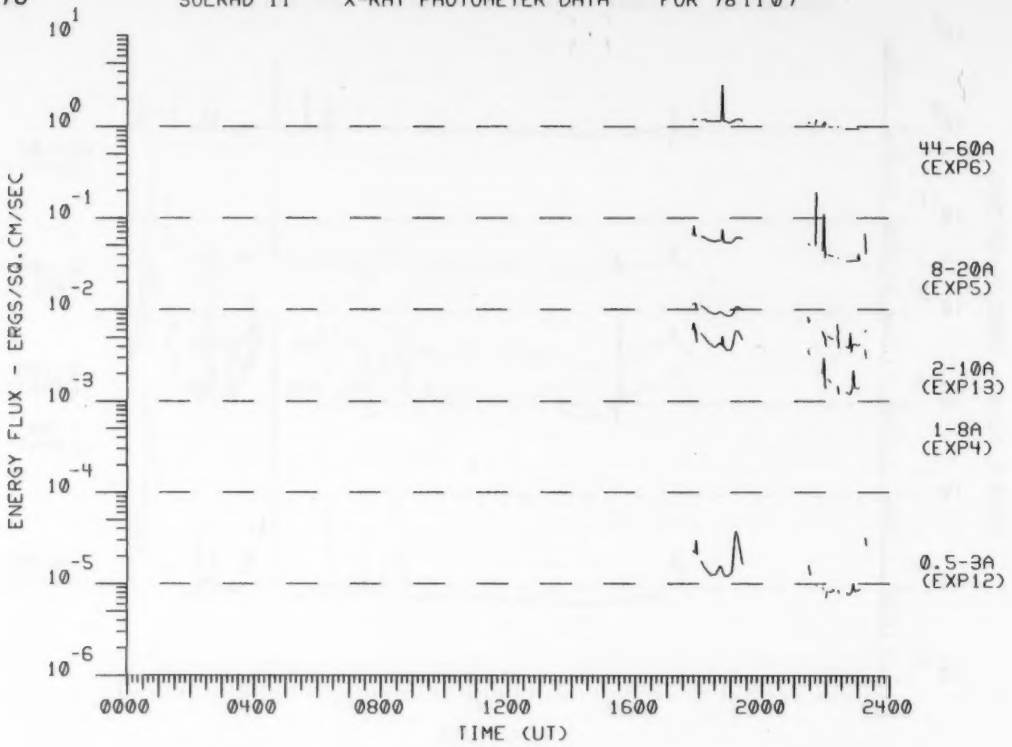
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781105



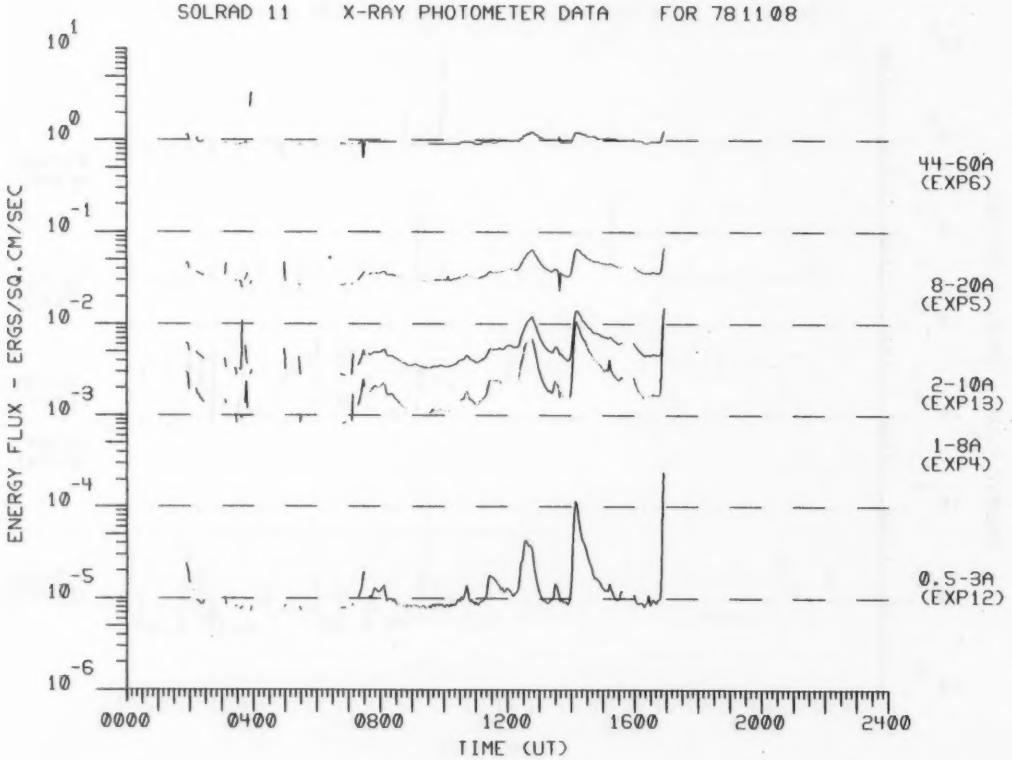
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781106

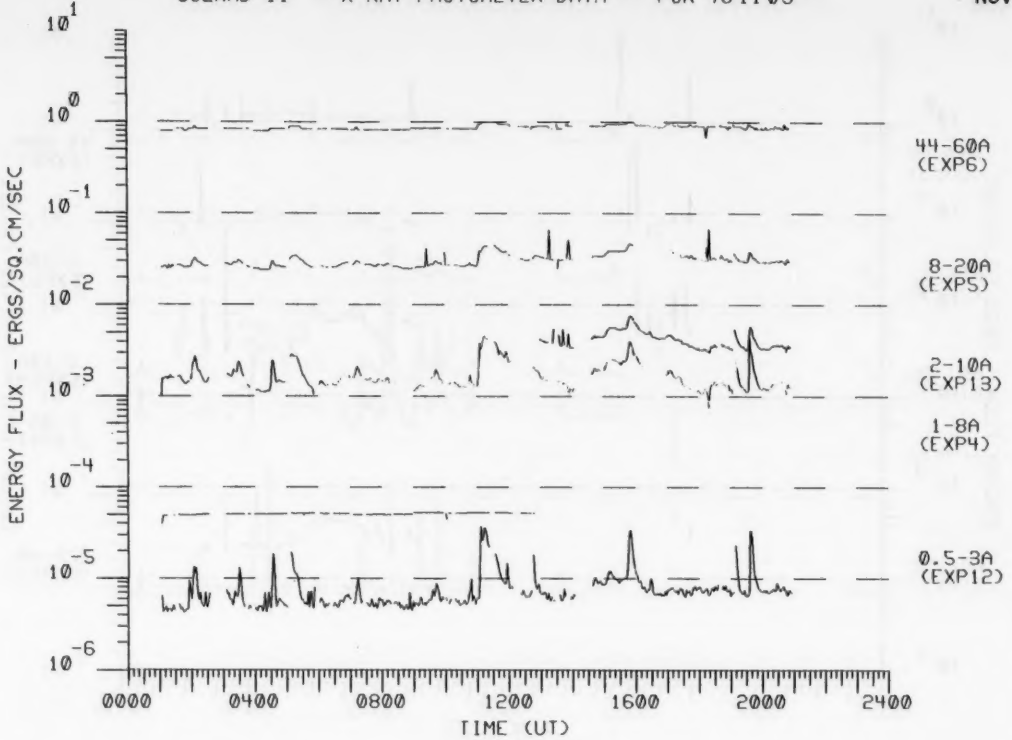


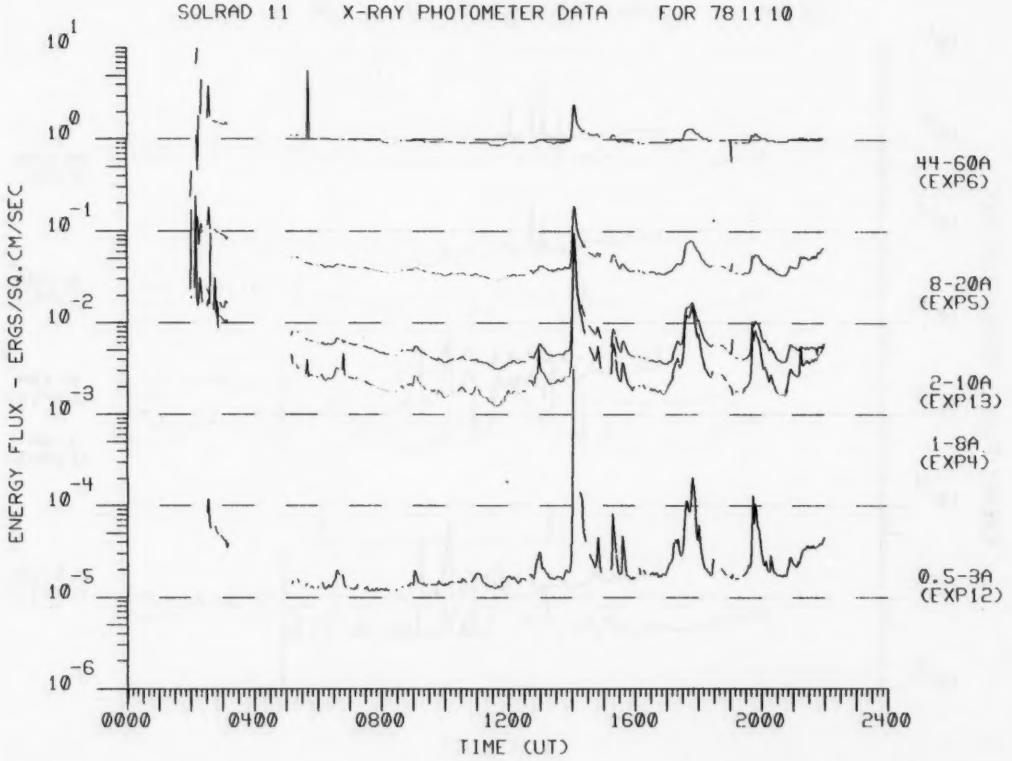
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781107

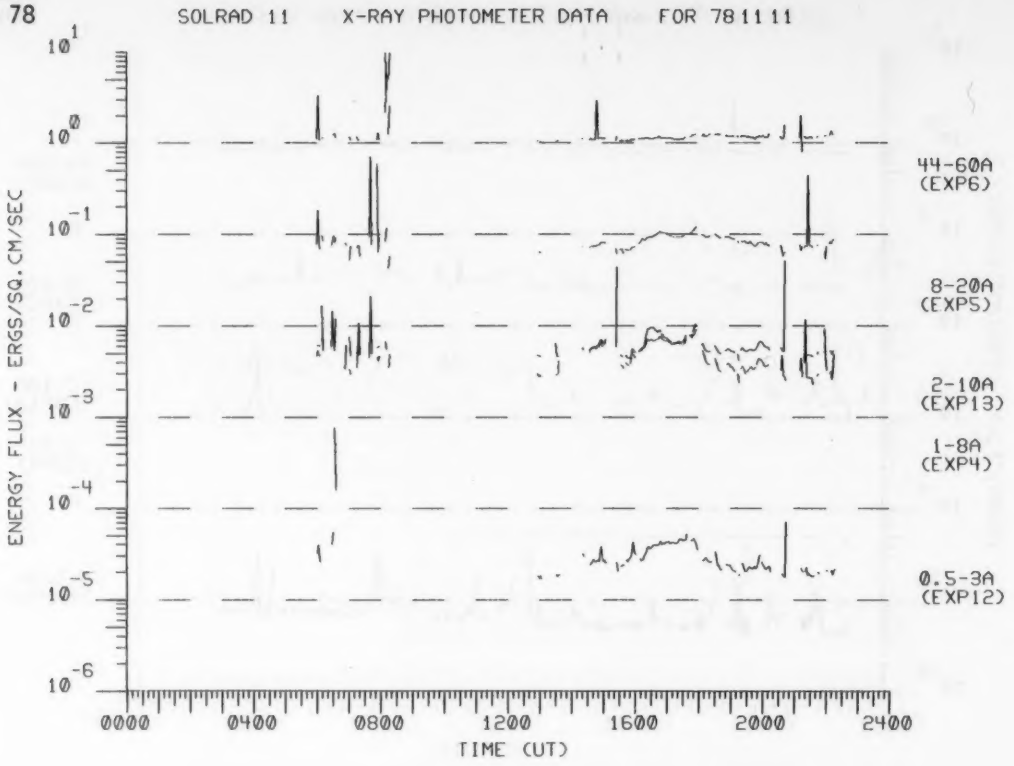


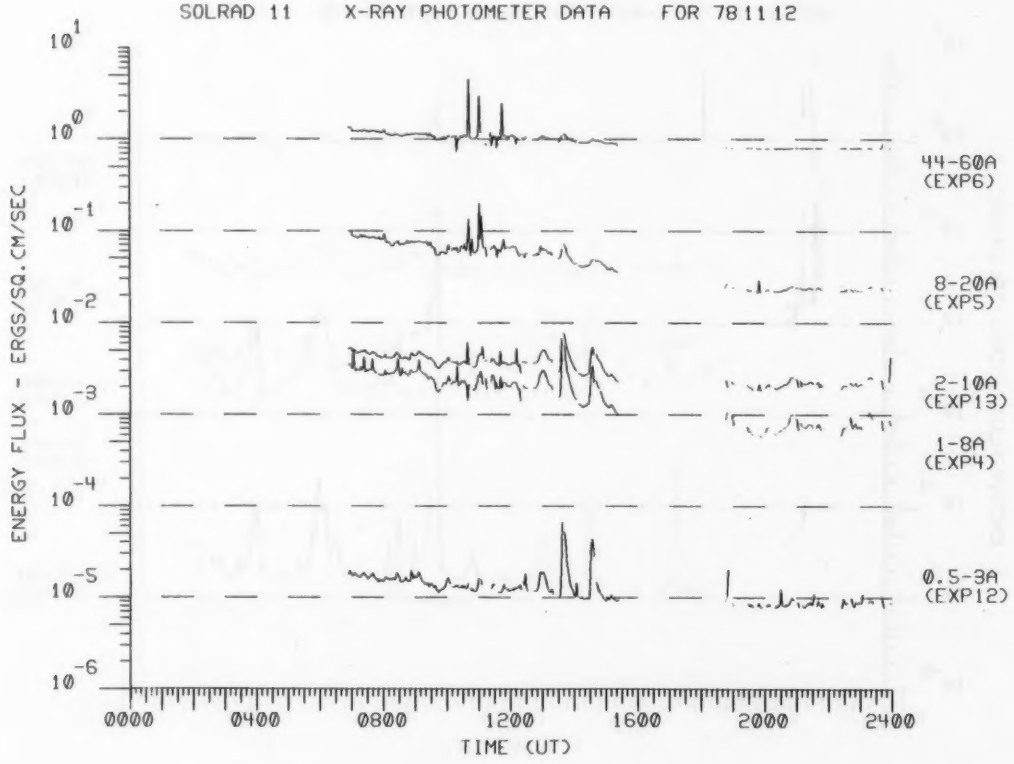
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781108

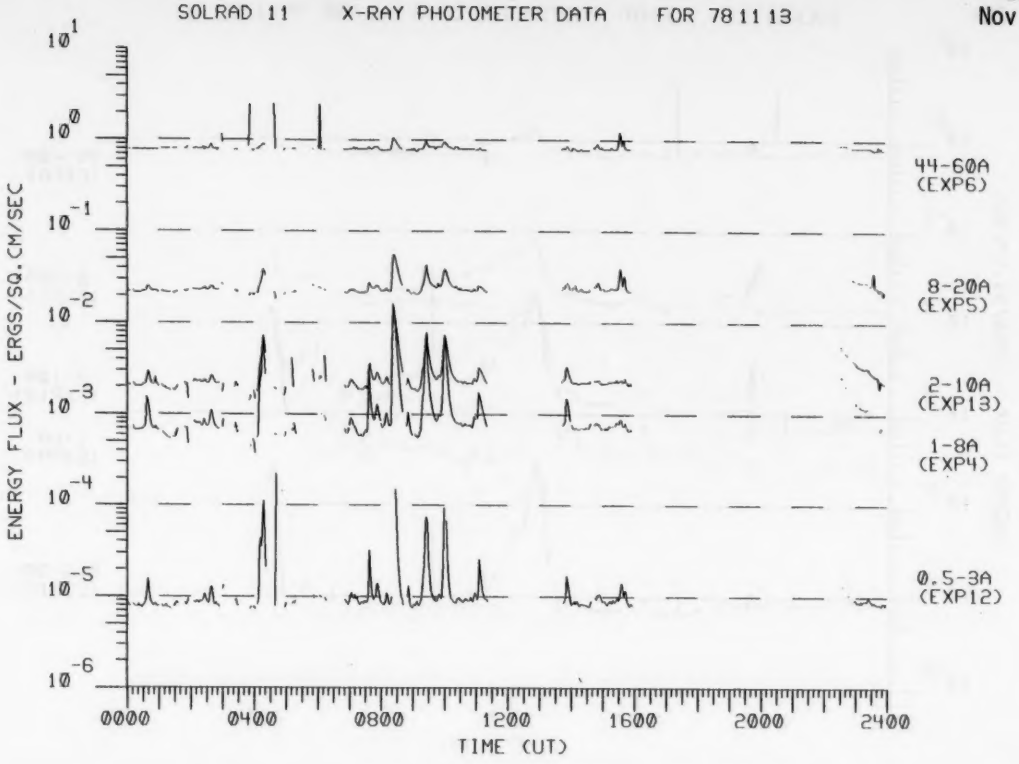


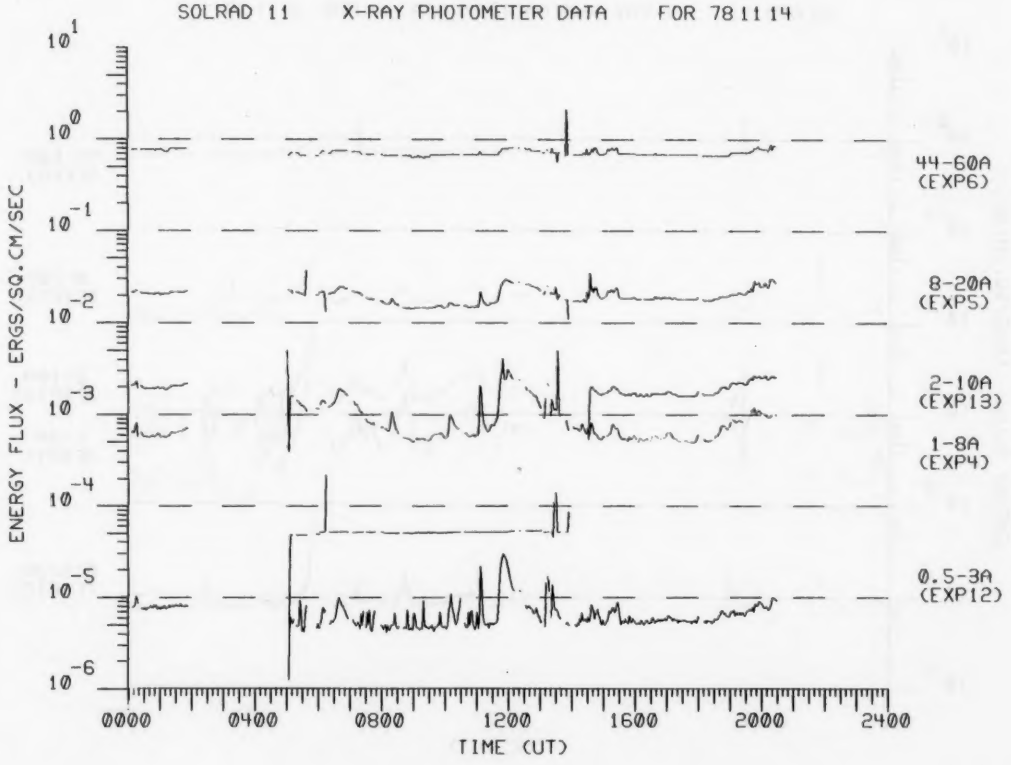

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781109
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781110
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

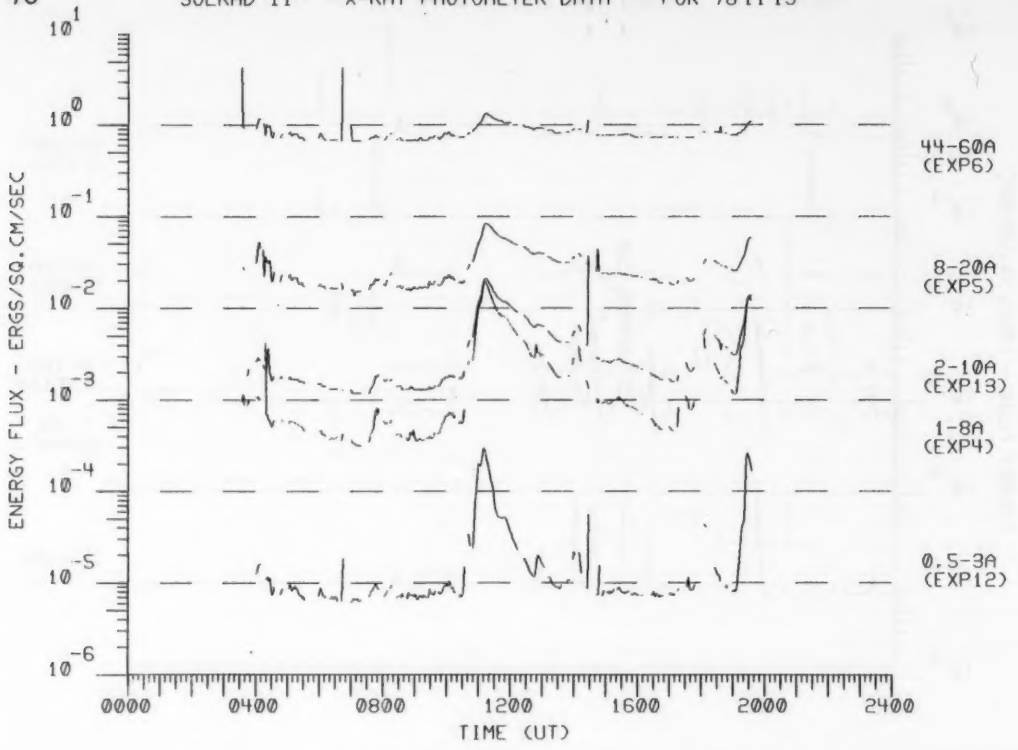

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781111
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781112
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

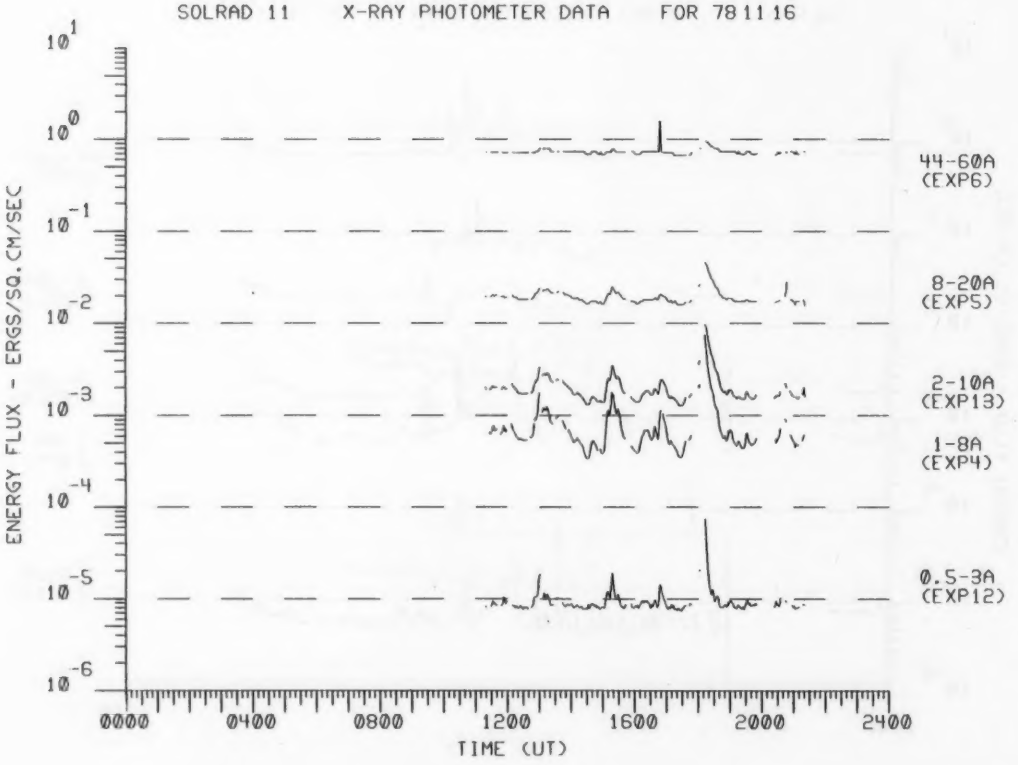

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781113
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781114
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

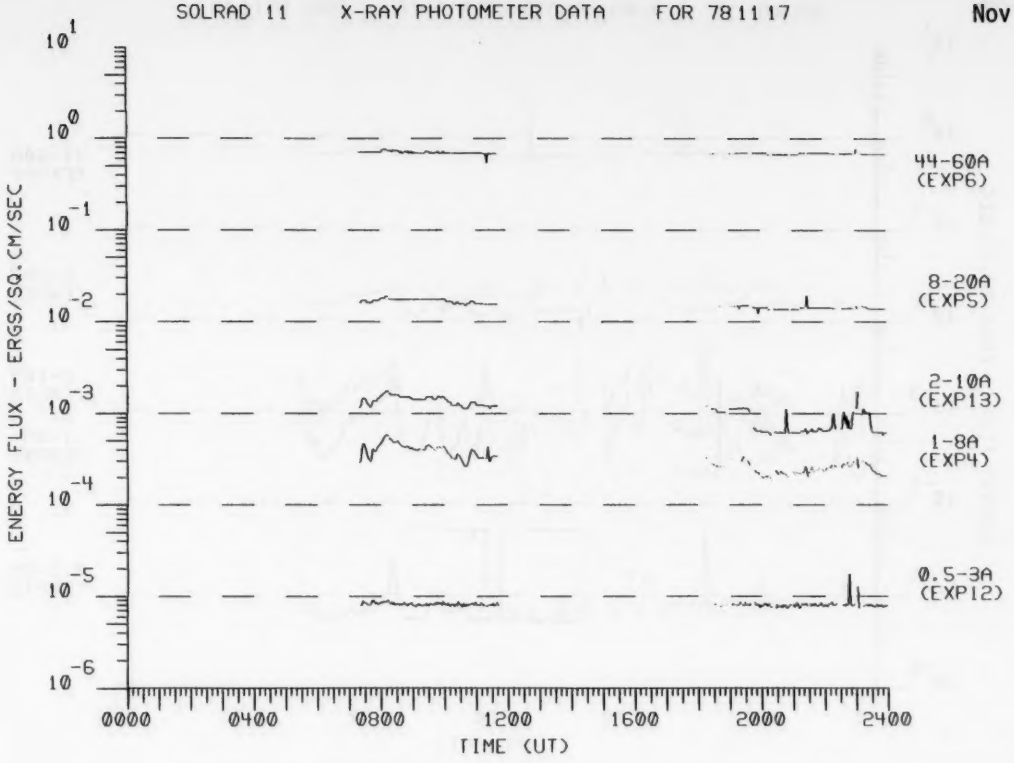
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781115



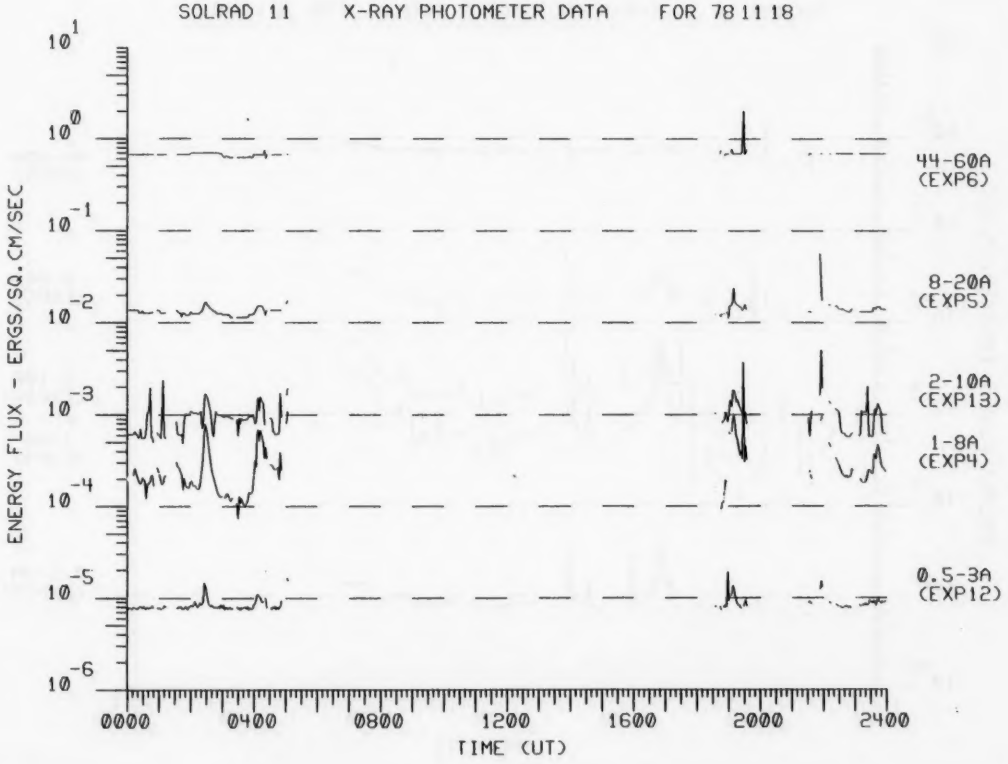
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781116



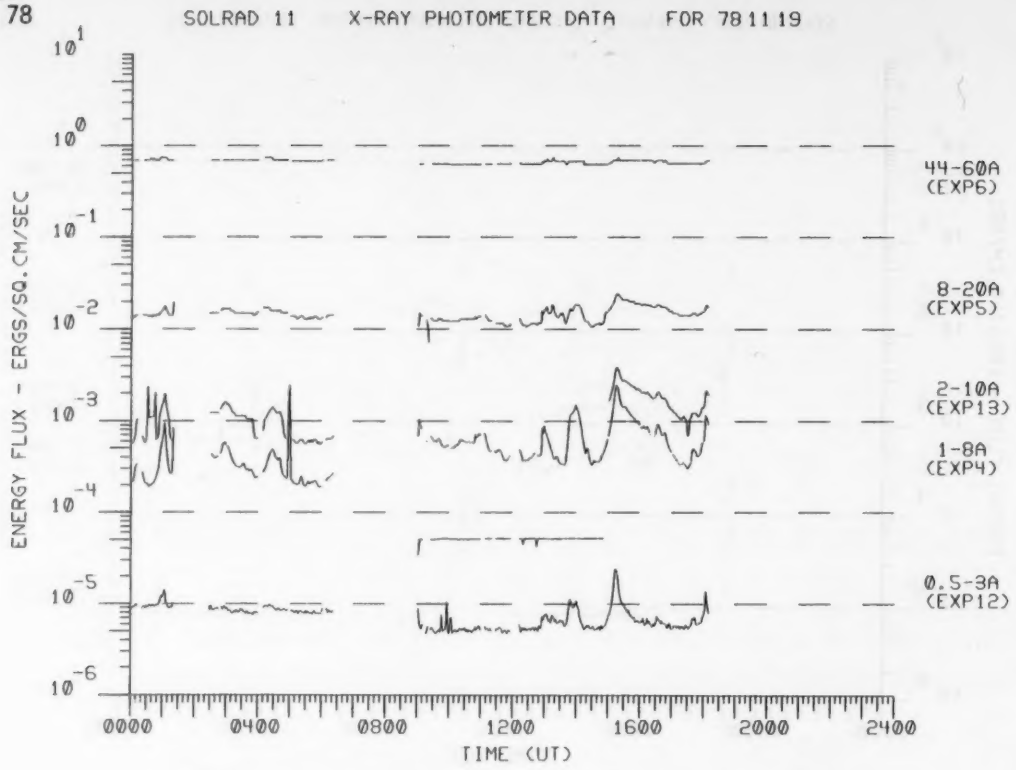
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 17



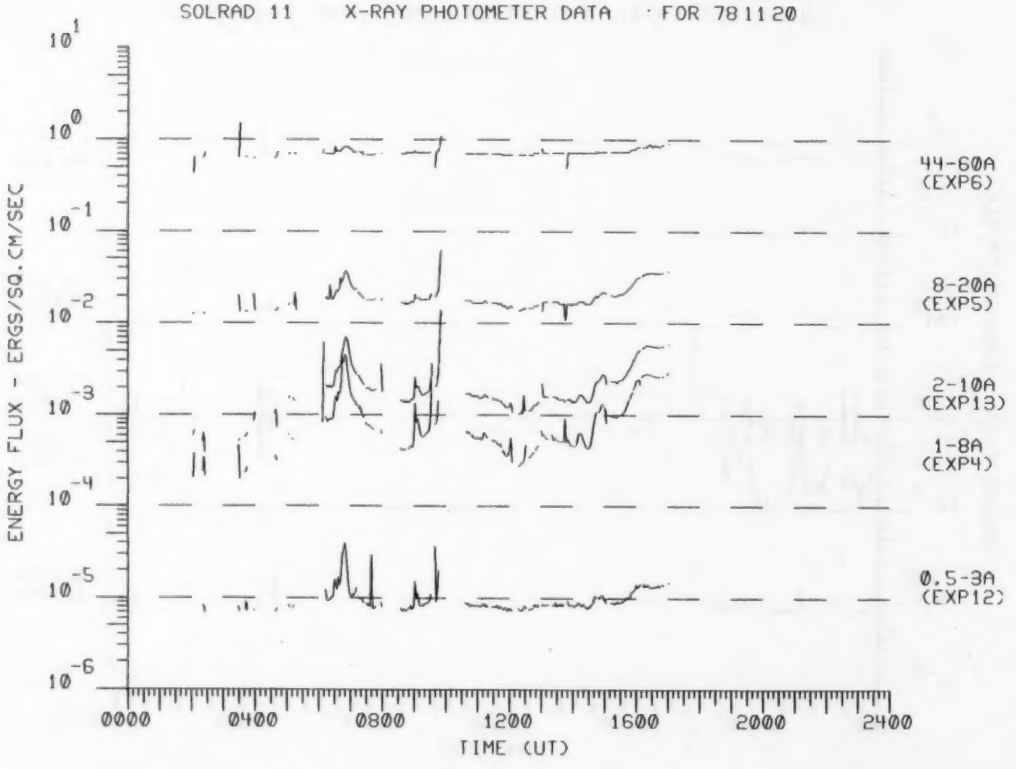
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 18

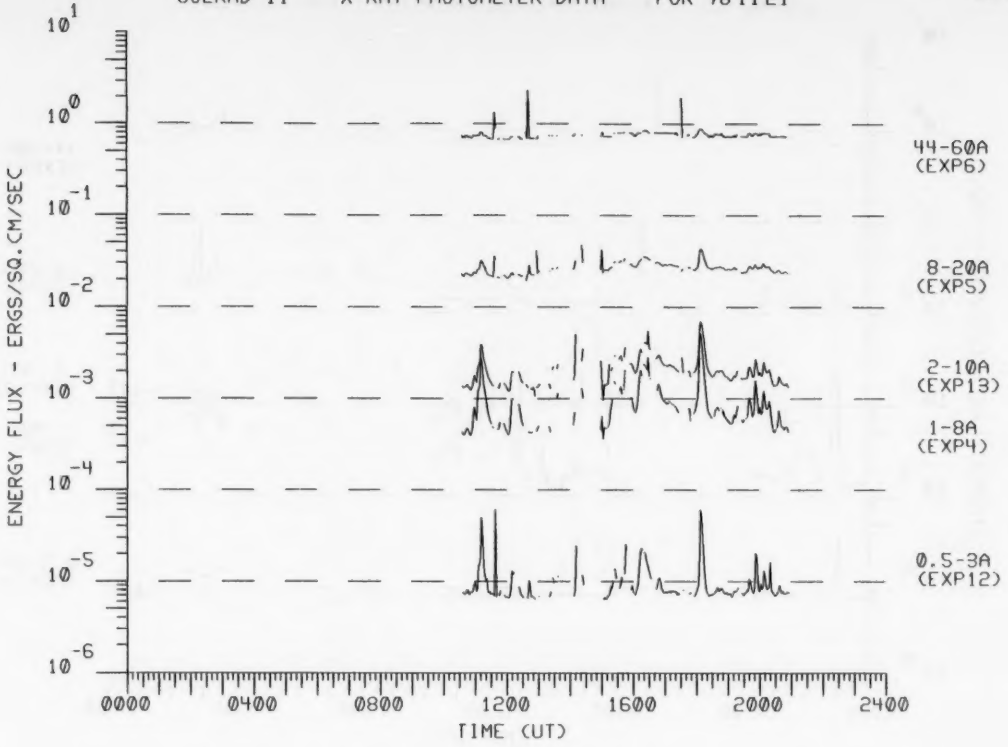


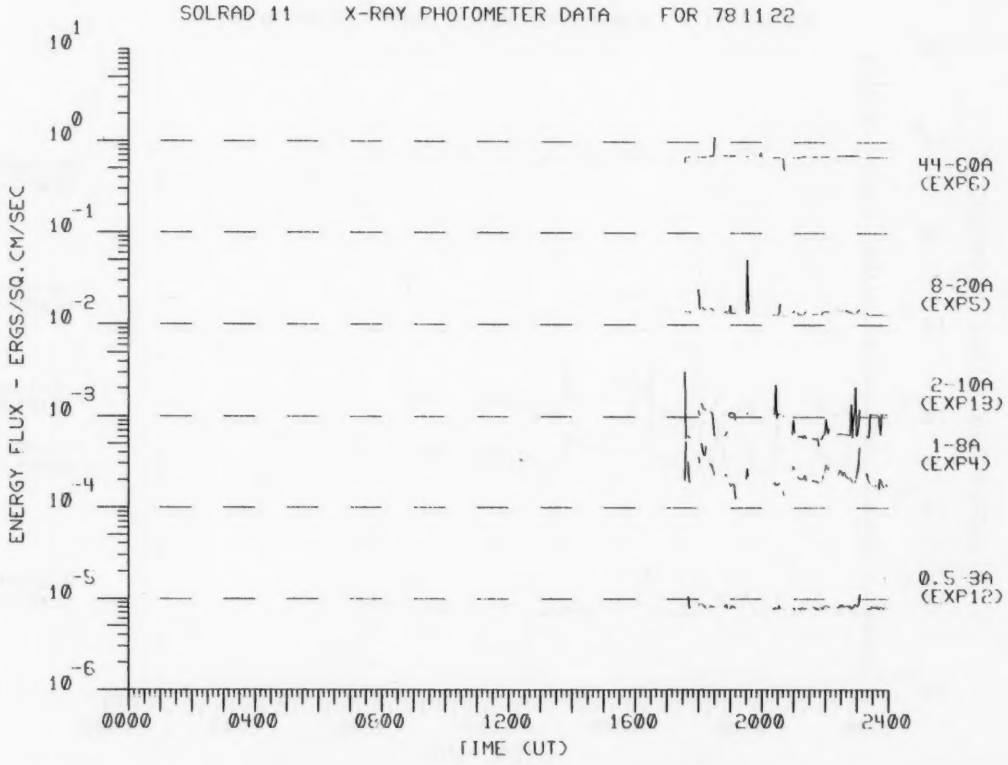
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781119



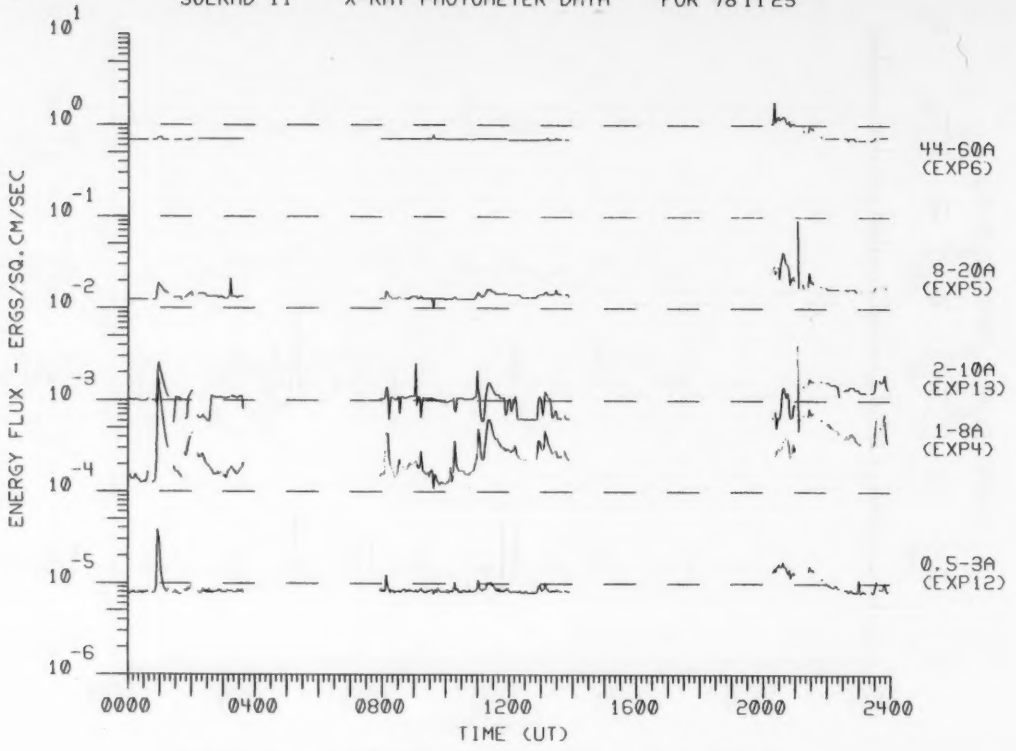
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781120



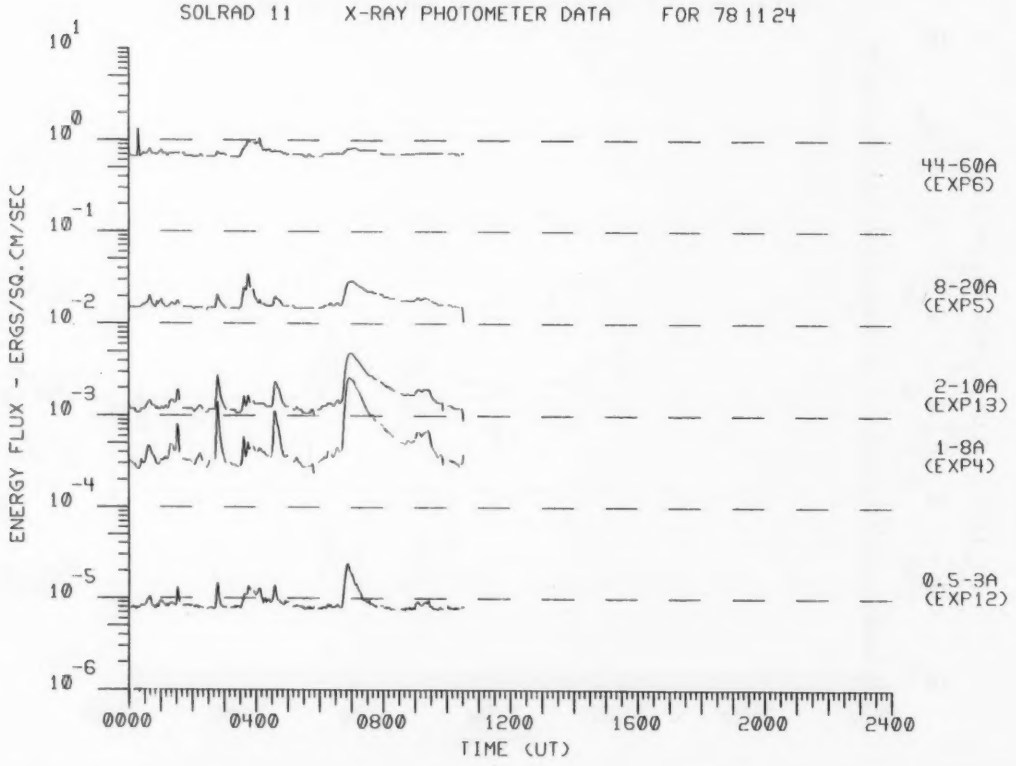

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781121
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

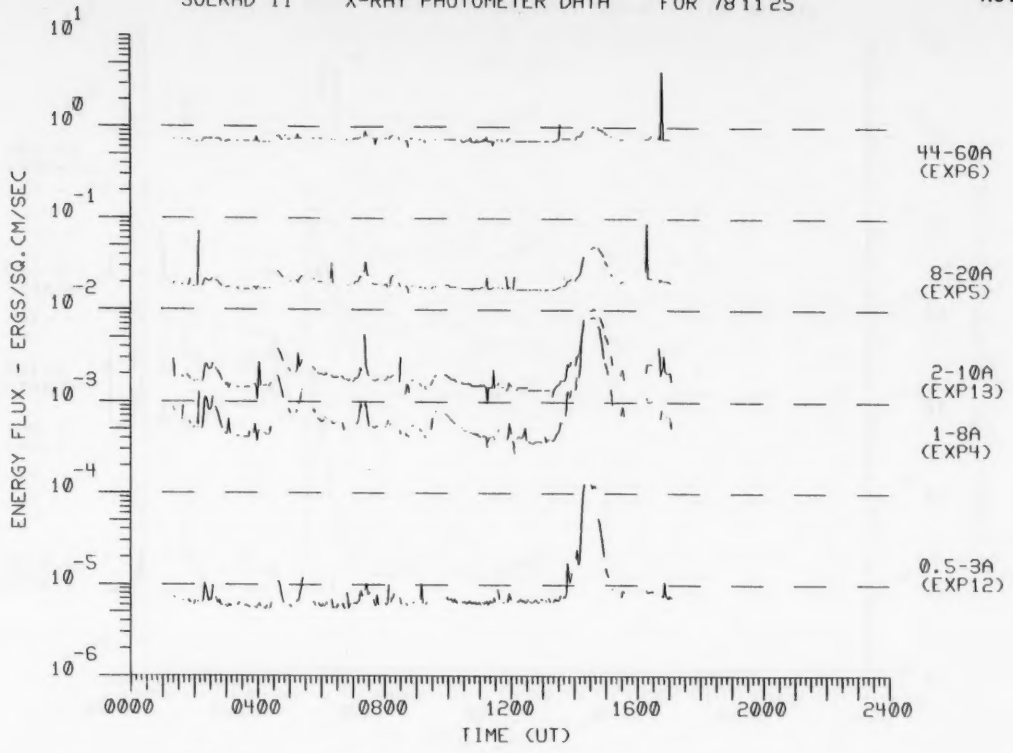

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781122
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

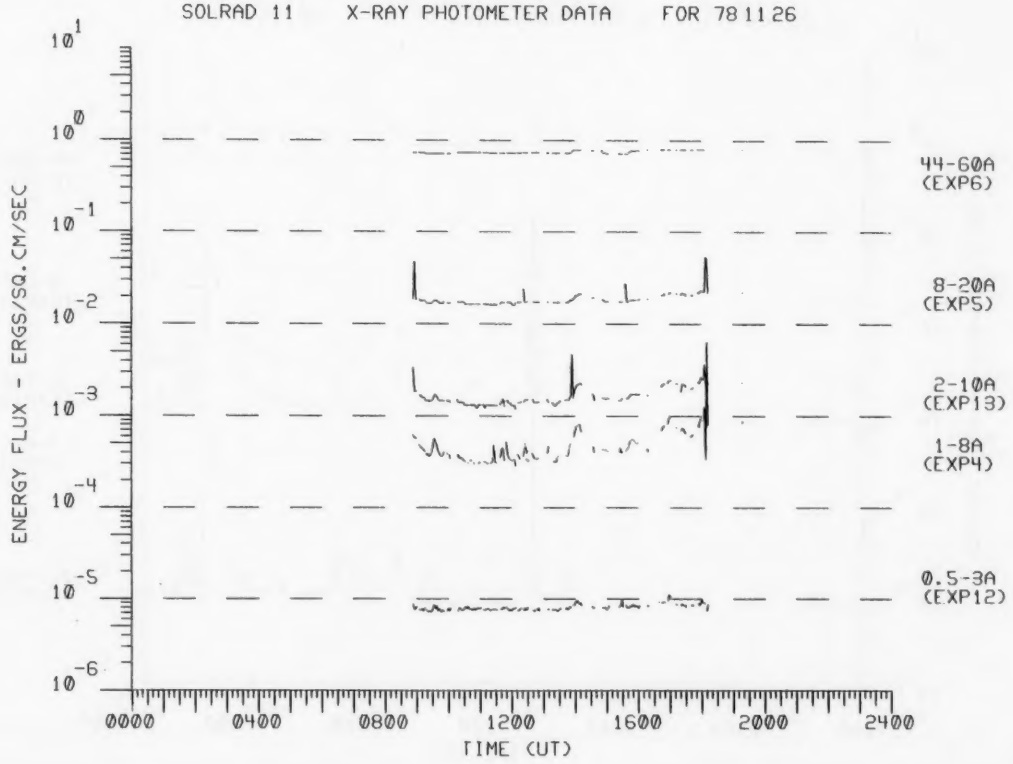
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781123

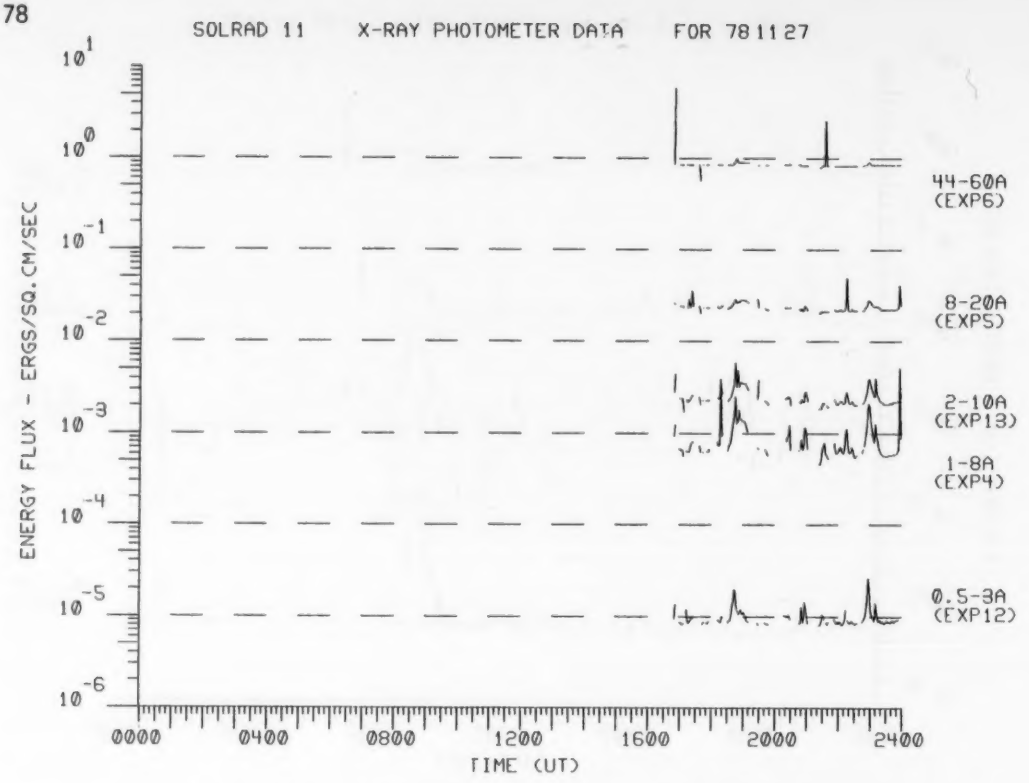


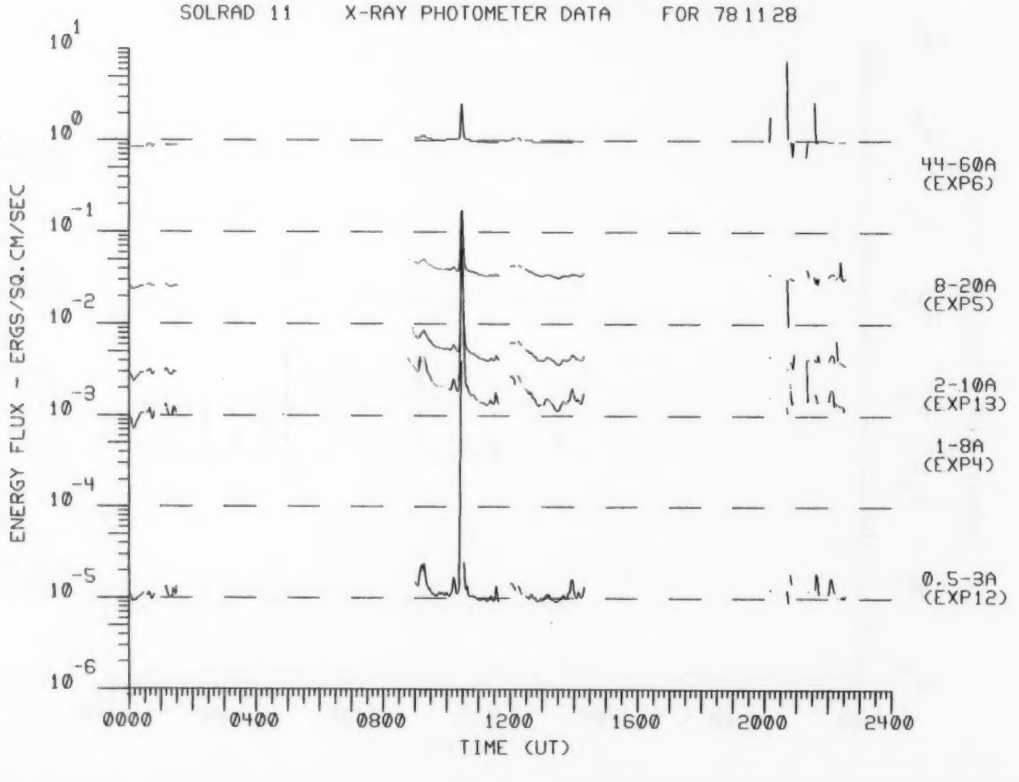
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781124



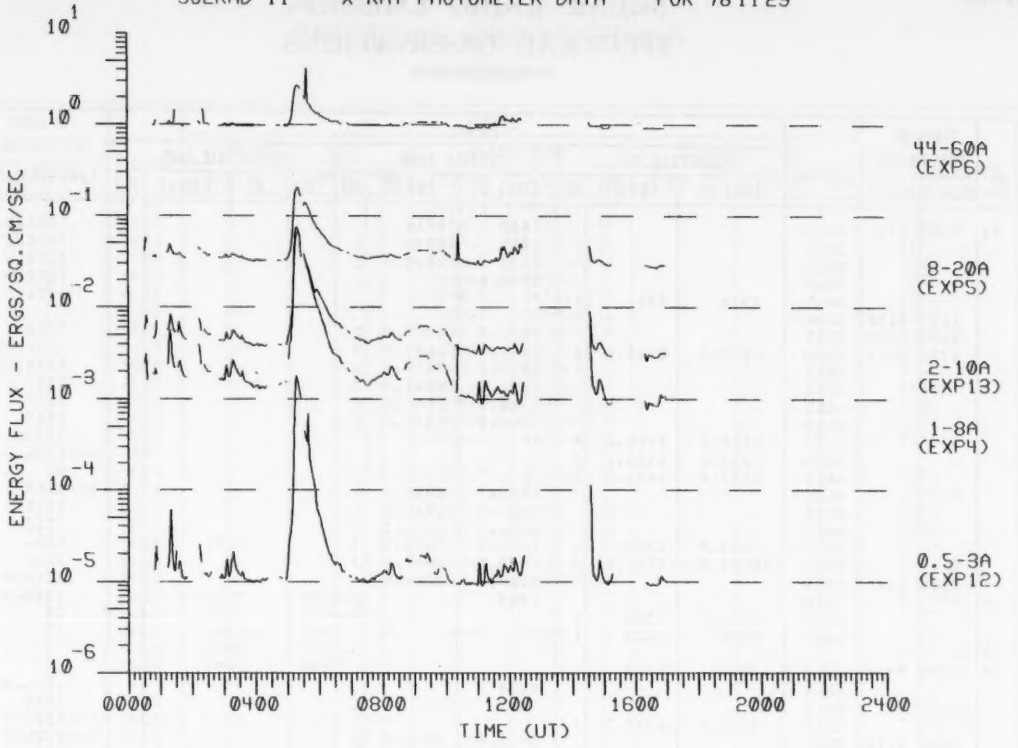

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781125
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781126
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

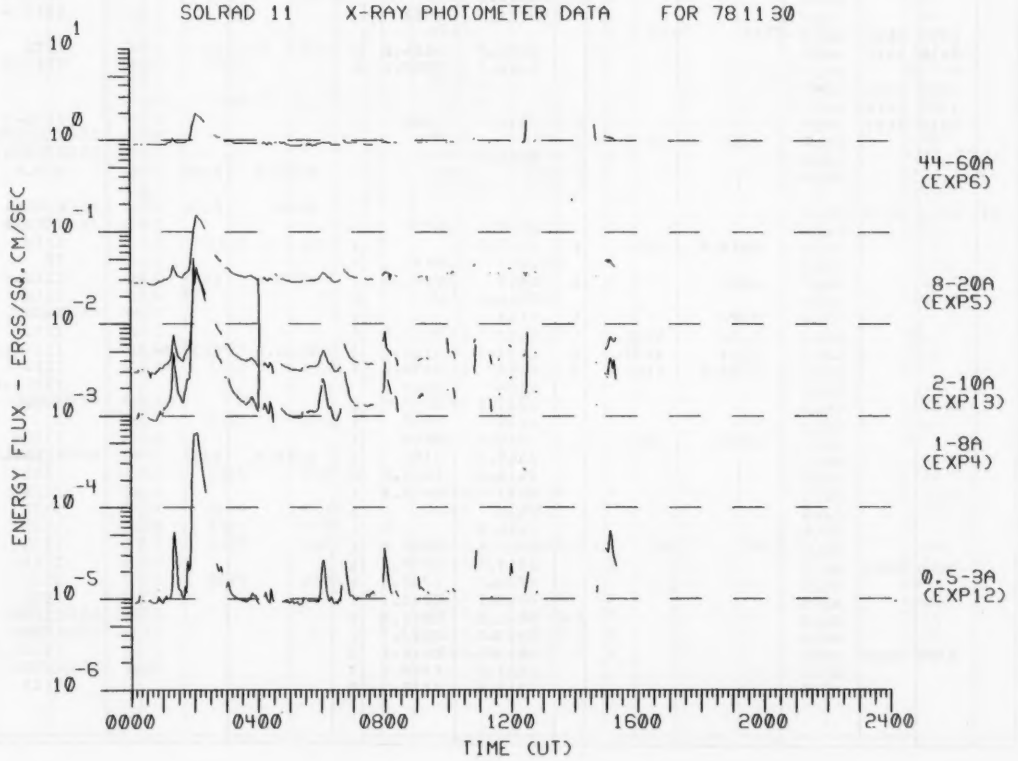

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781127
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781128
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781129



SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781130



SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1978

NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0711	CULG				0000	0711					IIIN,W
			CULG				0054	0055	1				IIIG,U
			CULG				0125	0125.5	1				IIIB,U
			CULG				0244.5		1				IIIB,U
			CULG	0318	0319	1							IIIG
	1121	2132	SGMR										
	0643	1528	WEIS				1152.3	1152.4	1				IIIG
	0720	1610	DURN	1155.5	1155.8	1	1152.4	1155.8	3				IIIG,RS
			WEIS				1155.7	1155.8	2				IIIB,UU
			WEIS				1221.6	1221.9	2				IIIG
			WEIS				1340.8	1341.0	1				IIIG
			WEIS				1343.9	1347.8	2				IIIG
			DURN	1346.2	1346.5	3							IIIGG
			DURN	1403.8	1404.1	3							IIIG
			WEIS	1403.8	1404.2	2							RS
			WEIS				1406.7	1406.8	1				IIIB
			WEIS				1414.5	1414.7	1				IIIG
			WEIS				1451.7	1454.2	2				IIIG
			DURN	1451.8	1453.3	1	1451.8	1453.5	3				IIIG
			DURN	1538.0	1541.6	3	1538.0	1541.6	3				IIIG
	2115	2400	CULG				2203.5	2204.5					IIIG,W
			CULG				2243						IIIB,W
			CULG	2336.5	2340	1							IN
			CULG	2350	2400	1							IS
02	0000	0321	CULG	0000	0040	1							IS
			CULG				0128						IIIB,W
			CULG				0218		1				IIIB
			CULG	0310.5	0311.5	1							IIIG
	0412	0715	CULG				0532.5	0533.5	2				IIIG,U
			CULG				0640.5						IIIB,W
			CULG				0711.5	0712					IIIG,W
	0725	1600	DURN										
	0646	1327	WEIS				0824.2	0824.3	1				IIIB
			WEIS				0846.7	0847.0	2				IIIG,U
	1122	2131	SGMR										
	1342	1526	WEIS										
	2016	2400	CULG				2016	2400					IIIS,W
			CULG	2145	2339	1							F DRIFT,N
			CULG				2206.5						IIIB,W,U
			CULG							2256.5	2400	1	S.W.F.
03	0000	0715	CULG							0000	0150	1	S.W.F.
			CULG				0010	0715					IIIN,W
			CULG	0015.5	0016	1	0015.5		1				IIIG
			CULG				0027	0121	1				IS
			CULG	0040		1	0040	0041.5	3	0040	0041	3	IIIG,V
			CULG				0044.5		2				IIIB
			CULG	0129		1	0129		1				IIIB
			CULG	0132	0132.5	1	0132	0132.5	1				IIIG
			CULG	0137	0137.5	2	0136.5	0139.5	2	0136.5	0138.5	2	IIIGG,V
			CULG	0158.5	0159.5	2	0159	0159.5	1				IIIG
			CULG				0235	0239					IIIGG,W
			CULG				0237.5	0238.5	1				IIIG
			CULG				0245	0247	1				I
			CULG	0250	0251	1	0249.5	0253	1				IIIGG
			CULG				0349.5	0354	2	0350.5	0353	1	IIIGG,V
			CULG				0418.5	0419.5	2				IIIG
			CULG				0437	0437.5	1				IIIG
			CULG				0444		1				IIIB
			CULG				0446.5		1				IIIB
			CULG				0555.5	0557	1				IIIG
	0648	1524	WEIS				0717.5	0717.6	1				IIIB
			WEIS				0739.5	0740.0	1				IIIG
			WEIS				0743.1	0743.2	1				IIIB
			WEIS				0801.3	0801.8	2				IIIG
			WEIS				0803.5	0803.7	2				IIIB
	0725	1600	DURN				0803.6	0818.1	3				IIIGG,N
			WEIS				0807.0	0808.8	2				IIIGG
			WEIS				0814.6	0815.0	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1978

NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
03			WEIS				0817.3	0818.1	3				IIIG
			WEIS				0822.7	0823.0	2				IIIB,U
			WEIS				0825.6	0826.0	3				IIIG
			DURN				0825.7	0825.9	3				IIIG
			WEIS				0841.8	0842.1	1				IIIB
			WEIS				0850.9	0851.2	1				IIIG
			WEIS				0857.6	0858.4	1				IIIG
			WEIS				0905.9	0906.4	2				IIIG
			WEIS				0908.0	0909.6	3				IIIG
			DURN				0908.1	0909.5	3				IIIGG
			WEIS				0932.3	0932.7	1				IIIG
			WEIS				0935.0	0935.3	2				IIIG
			WEIS				0943.9	0945.2	1				IIIG
			WEIS				1024.4	1025.8	1				IIIG
	1124	2130	SGMR										
			WEIS				1514.6	1514.8	2				IIIG
	2018	2400	CULG				2018	2210					IIIS,W
			CULG				2018	2400	1				IIIN
			CULG				2036	2036.5	1				IIIG
			CULG	2044		1	2044		1				IIIB
			CULG				2154.5	2155	2	2154.5	2155	1	IIIB,U
			CULG				2210	2335.5					IIIN,W
			CULG	2226	2226.5								F DRIFT,W
			CULG	2229	2229.5	1							FAST DRIFT
			CULG	2309.5	2310	1	2309.5	2311	2				IIIG
			CULG	2355	2355.5	1							FAST DRIFT
			CULG	2359	2400	1							F DRIFT,W
04			CULG				0000	0715					IIIN,W
	0000	0715	CULG	0000	0000.5	1							F DRIFT,W
	0000	0900	MANI										
			CULG	0004.5	0005.5	2	0005	0005.5	1				IIIG
			CULG				0023	0026	1				IIIG
			CULG				0025		1	0025	0025.5	1	IIIB
			CULG	0145.5	0146	1							FAST DRIFT
			CULG	0514			0514						IIIB,W
			CULG				0532.5		1				IIIB
			CULG	0649.5	0650	1	0649.5	0650	1				IIIG
			WEIS				0817.4	1409.4	2				IS
	0725	1600	DURN				0840	1150	1				I,DC
	0649	1523	WEIS				0902.2	0903.3	1				IIIG
			WEIS				0908.7	0909.2	1				IIIG
			WEIS				1106.7	1106.8	2				IIIG
	1125	2128	SGMR										
	2015	2400	CULG				2015	2135	1				IIIS
			CULG	2015	2225								IS,W
			CULG				2015	2223	1				IS,DC
			CULG				2015	2106	1				N,RS,DP
			CULG				2135	2400					IIIS,W
	2200	2400	MANI										
			CULG				2223	2338					IS,W
			CULG	2225	2354								IN,W
			CULG	2354	2400	1	2338	2400	1				IS
05	0000	0715	CULG				0000	0715					IIIS,W
			CULG	0000	0134								IN,W
			CULG				0000	0214	1				IS
	0000	0900	MANI										
			CULG	0015	0017.5	1							IIIG
			CULG				0036.5	0037	2				IIIG,U
			CULG	0134	0715		0214	0715					IS,W
			CULG	0405	0430	1							IS
			CULG	0420	0422	1	0419.5	0423.5	2	0420	0423.5	2	IIIGG
			CULG				0447.5		1				IIIB
			CULG	0539	0631	1							IS
			CULG				0637	0701	1				IIIS
	0651	0804	WEIS				0713.0	1519.5	2				IIIS
	0857	1521	WEIS				1038.6	1038.8	3				IIIG
			WEIS				1056.3	1056.8	2				IIIG
	1126	2127	SGMR										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
NOVEMBER 1978

NOV 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
05	1141	1600	DURN				1141 E	1600 D	1				I
			CULG				2015	2341	1				N,RS,DP
	2015	2400	CULG				2015	2400	1				IIIS
			CULG	2015	2350								IS,W
			CULG				2015	2400	1				IS,DC
	2158	2400	MANI										
			CULG				2248.5		2				IIIB
			CULG	2306		1	2306		2				IIIB
			CULG	2335	2335.5	1	2335	2335.5	2				IIIG
			CULG	2350	2400	1							IS
			CULG	2356.5	2357	1	2356.5	2357	2				IIIG
06	0000	0612	CULG				0000	0612					IIIS,W
			CULG	0000	0217								IS,W
			CULG				0000	0612	1				IS,DC
			CULG				0000	0612	1				IIIN
	0000	0900	MANI										
			CULG	0001	0001.5	1	0001	0001.5	1				IIIG
			CULG	0044	0045	2	0044	0045.5	3				IIIG,V
			CULG	0047		1	0047		1				IIIB
			CULG	0050.5	0051	1	0050.5	0051	2				IIIG
			CULG	0053.5	0054	1	0053.5	0054	1				IIIG
			CULG	0124.5	0127	1	0124.5	0127	1				IIIG
			CULG	0217	0612	1							IS
			CULG	0309.5			0309.5						IIIB,W
			CULG	0556.5	0557	1	0556.5	0557	1				IIIG
	0652	1519	WEIS				0702.0	1448.0	2				IS
	0715	1550	DURN				0715 E	1400	2				I,DC
			WEIS				0738.5	1508.2	2				IIIS
			DURN				0820.0	0820.8	1				IIIG
			DURN				0847.3	0847.5	2				IIIG
			DURN				0928.4	0928.6	3				IIIG
			DURN				1018.3	1020.3	3				IIIGG
			WEIS				1018.3	1021.5	3				IIIG
			WEIS				1324.8	1326.3	3				IIIG
			DURN				1324.9	1325.1	3				IIIGG
	1127	2126	SGHR				1325.5	1326.3	2				III
			DURN				1348.8	1349.3	3				IIIG
			DURN				1427.4	1427.6	3				IIIG,U
			DURN				1507.9	1508.1	3				IIIG
			CULG				2108	2400	1				IS,C,DC
	2108	2400	CULG				2108	2400	1				IIIS
	2146	2400	MANI										
			CULG				2239	2240	2				IIIG
			CULG				2252.5	2253	3				IIIB
07			CULG				0000	0715					IIIS,W
			CULG	0000	0715	1							IS
	0000	0715	CULG				0000	0222	1				IS,C,DC
	0000	0858	MANI										
			CULG				0032		1				IIIB
			CULG				0222	0355	2				IS,C,DC
			CULG				0326.5		2				IIIB
			CULG				0338.5						IIIB
			CULG				0355	0715	1				IS,C,DC
			CULG				0455.5	0456.5	1				IIIG
			CULG				0648		2				IIIB
	0655	1158	WEIS				0658.5	1518.0	2				IS
	1203	1518	WEIS				0712.6	1514.0	2				IIIS
	0714	1542	DURN				0714 E	1542 D	3				I,C,DC
	1129	2125	SGHR				1838.5	1844.7	2				IIIG
			SGHR				1955.3	1955.7	2				IIIG
			CULG				2015	2400	1				N,RS,DP
	2015	2400	CULG				2015	2400	1				IIIS
			CULG	2015	2400	1							IS
			CULG				2015	2400	2				IS,C,DC
			CULG							2111	2145	1	IIIN
			CULG				2118	2120.5	2	2118.5	2119.5	1	IIIGG
			CULG				2121.5		2	2121.5		2	IIIB
			CULG				2202.5	2203	1				DP

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

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NOV 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
07	2204	2400	MANI										
			CULG				2254		2				IIIB
08	0000	0657	CULG				0000	0657	1				IIIS
			CULG	0000	0657	1							IS
			CULG				0000	0657	1				IS,C,DC
	0000	0858	MANI										
			CULG				0006	0657	1				N,RS,DP
			CULG	0007.5	0008	1	0007.5	0008	2				IIIG
			CULG	0244	0254.5	2	0247	0253	3	0247	0253	3	IIIGG
			CULG	0301	0302.5	1							IIIG
			CULG	0442.5	0443	1	0442.5	0443	2				IIIG
			WEIS				0659.0	1458.0	2				IS,CONT
	0656	1516	WEIS				0659.0	1511.3	2				IIIS
	0714	1510	DURN				0714 E	1510 D	2				I,C,DC
			DURN				1030.2	1031.5	2				IIIGG
			DURN				1246.9	1247.5	2				IIIG
	1130	2124	SGMR				1312.5	2124.0D	1				CONT
			SGMR				1751.3	1754.2	3				IIIG
	2017	2400	CULG				2017	2400	1				IS,C,DC
			CULG				2017	2132	1				N,RS,DP
			CULG				2017	2153	1				IIIS
			CULG	2017	2400	1							IS
			CULG				2029.5	2030	2				IIIB
			CULG				2153	2400					IIIS,W
	2153	2400	MANI										
09	0000	0907	MANI										
	0000	0715	CULG				0000	0715					IIIS,W
			CULG	0000	0141								IS,W
			CULG				0000	0715	1				IIIN
			CULG				0000	0210	1				IS,C,DC
			CULG				0019	0020.5	1				DP
			CULG				0112.5	0455	1				N,RS,DP
			CULG				0119	0121	1	0121		1	IIIGG
			CULG	0141	0553	1							IS
			CULG				0142.5	0143	2	0142.5		1	IIIB
			CULG	0146	0147	1	014E	0147.5	2	0146	0147	1	IIIGG
			CULG	0203	0204.5	2	0203	0205	3	0203	0205	2	IIIGG,U
			CULG	0205.5	0210	1	0205.5	0210	2	0206	0209.5	1	IIIGG
			CULG				0210	0715	1				IS,DC
	0714	1550	DURN				0714 E	1550 D	1				I,DC
			WEIS				0840.5	1513.0	1				IIIN
	0739	1416	WEIS				0954.1	0955.6	3				IIIG
			DURN				0954.1	0955.6	3				IIIGG
			DURN				1003.6	1003.9	3				IIIG
			WEIS				1003.6	1003.9	3				IIIG
	1457	1516	WEIS				1043.6	1515.0	1				IN,DC
			DURN	1047.7	1047.9	3							IIIG
	1131	2123	SGMR										
			DURN	1154.9	1156.4	1							IIIG
			CULG				2016	2400	1				IIIN
	2016	2400	CULG				2016	2400					IIIS,W
			CULG	2016	2049	1	2016	2400	1				IS
			CULG				2028	2115	1				N,RS,DP
			CULG				2031.5	2032	1	2031.5	2032	1	IIIG
			CULG				2049.5		1				IIIB
			CULG	2117	2117.5		2117	2117.5					IIIG,W
			CULG	2125	2126.5	1	2125.5	2127	1				IIIG
			CULG				2139		1	2139		1	IIIB
			CULG	2155	2247	1							IS
	2155	2400	MANI										
			CULG	2247	2400								IS,W
10	0000	0716	CULG				0000	0249	1				IIIS
			CULG				0000	0716	1				IS,DC
	0000	0858	MANI										
			CULG	0014	0054	1							IS
			CULG							0050	0135	1	S.W.F.
			CULG				0059	0716	2	0108	0510		IV

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NOV 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
10			CULG				0109.5	0128.5	3				II
			CULG							0120.5	0121	2	UNCLF
			CULG							0142.5	0144	1	SLOW DRIFT
			CULG							0243	0313		IIIS,W
			CULG				0249	0322	2				IIIS
			CULG				0252	0255	3				IIIG
			CULG				0259	0259.5	3	0259		2	IIIG
			CULG				0301	0302.5	2				IIIG
			CULG							0313	0403	1	IIIS
	0714	1550	DURN				0714 E	1230	1				I
	0658	0830	WEIS				0740.5	1512.2	1				IIIN
	0835	1515	WEIS				0916.7	0917.5	3				IIIG
			DURN				0916.8	0920.4	3				IIIGG
			WEIS				0920.0	0921.2	3				IIIG
	1132	2121	SGMR										
			WEIS				1158.1	1159.8	3				IIIG
			DURN	1356.6	1356.6	3							III
			DURN	1443.8	1444.6	3							IIIGG
			DURN	1533.6	1534.0	3							IIIGG
	2016	2400	CULG	2016	2042	1							IS
			CULG				2016	2400	1				IIIS
			CULG				2016	2302	1				IS,DC
			CULG	2028	2028.5	1	2028	2028.5	1				IIIG
			CULG				2119.5	2121.5	1	2119.5	2121.5	1	IIIGG
			CULG				2127.5	2129.5	1	2127	2129	1	IIIGG
			CULG				2138.5	2139.5	1	2139	2139.5	1	IIIG
	2154	2400	MANI										
			CULG	2203.5	2204.5	2							FAST DRIFT
			CULG	2210	2302								IS,W
			CULG	2214.5	2215	1	2214.5	2215	1				IIIG
			CULG				2217.5	2218	1	2217.5	2218	1	IIIG
			CULG	2302	2339	1	2302	2319	1				IS
			CULG				2306	2307	1	2306	2307	1	IIIG
			CULG				2316.5		1	2316.5		1	IIIB
			CULG				2319	2400	1				IS
			CULG	2327	2327.5	2	2327	2327.5	3				IIIG
			CULG	2333	2333.5	2	2333	2333.5	2				IIIG
			CULG	2343		2	2343		3				IIIB
11	0000	0716	CULG				0000	0236	1				IS,DC
			CULG				0000	0032	1				IIIS
	0000	0854	MANI										
			CULG				0032.5	0042	2	0032.5	0042	2	IIIGG
			CULG				0042	0716	1				IIIS
			CULG				0046		1	0046		1	IIIB
			CULG				0117.5	0118	2	0117.5	0118	2	IIIG
			CULG				0132.5	0133	2	0132.5	0133	2	IIIG
			CULG	0204.5	0205	1							IIIG
			CULG				0205	0206	1				IIIG
			CULG	0208.5	0209.5	2	0208.5	0209	1				IIIG
			CULG	0220.5	0221	1							FAST DRIFT
			CULG				0236	0716	1				IS
			CULG	0324	0324.5	1							FAST DRIFT
			CULG	0330.5	0331	2	0330.5	0331	1				IIIG
			CULG	0348.5	0349	1	0348.5	0349	2				IIIG
			CULG	0355.5		1							FAST DRIFT
			CULG				0418	0418.5	2	0418	0418.5	1	IIIG
			CULG				0420.5		2				IIIB
			CULG				0513.5	0514	2				IIIB
			CULG	0609	0609.5	1							FAST DRIFT
			CULG				0612	0612.5	2				IIIG
	0700	1513	WEIS				0708.0	1512.0	2				IS,DC
			WEIS				0725.0	1457.0	2				IIIS
	0714	0740	DURN				0725.3	0738.0					IIIGG,N
			WEIS				0730.0	0738.5	3				IIIG
	0823	1550	DURN				0823 E	1430	1				I,DC
			DURN				0840.3	0845.0	3				IIIGG
			WEIS				0840.3	0845.5	3				IIIGG
			WEIS				0858.3	0904.2	3				IIIGG,V
			DURN	0858.3	0904.2	2	0858.3	0904.2	3				IIIGG,V

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
11			OURN				1008.0	1008.4	1				IIIG
			WEIS				1026.5	1032.5	3				IIIGG,V
			OURN	1030.6	1040.0	3	1028.4	1040.0	3				IIIGG,N
			WEIS				1036.0	1040.0	3				IIIGG
			OURN				1200.1	1200.5	1				IIIG
			OURN				1216.4	1217.2	3				IIIGG
			WEIS				1216.4	1217.8	3				IIIGG
	1134	2120	SGMR				1216.8	1217.9	2				V
			SGMR				1217.9	1729.0	2				CONT
			WEIS				1223.6	1225.3	3				IIIG
			OURN				1223.7	1224.6	3				IIIG
			SGMR				1224.3	1224.7	2				V
			OURN	1224.6	1225.7	3							IIIG
			WEIS				1227.5	1228.0	2				IIIG
			WEIS				1311.2	1313.6	3				IIIGG
			OURN				1311.2	1314.9	3				IIIGG
			WEIS				1412.1	1417.3	3				IIIGG,IV
			OURN				1412.2	1417.3	3				IIIGG
			SGMR				1412.3	1417.0	3				IIIG
			OURN				1450.5	1450.8	2				IIIG
			OURN				1535.9	1536.0	2				III
			CULG				2016	2212	1				IS,C,DC
	2016	2400	CULG				2016	2212	1				IIIS
			CULG	2036	2110	1							IS
			CULG	2110	2200	1							IS
			CULG	2130	2130.5	1				2130	2130.5	1	IIIG
			CULG							2138	2144	1	IIIN
			CULG	2200	2230	1							IS
	2200	2400	MANI										
			CULG				2212	2341	2				IS,C,DC
			CULG				2212	2322	2				IIIS
			CULG							2229	2320	1	IIIN
			CULG	2230	2400	1							IS
			CULG				2322	2400	1				IIIS
			CULG				2341	2400	1				IS,C,DC
12	0000	0715	CULG				0000	0715					IIIS,W
			CULG				0000	0715	1				IS,C,DC
	0000	0533	MANI										
			CULG	0254	0254.5	2							FAST DRIFT
			CULG	0546.5	0549	1							FAST DRIFT
			CULG				0637.5		2				IIIB
			CULG				0639		2				IIIB
			CULG	0649	0715								IS,W
	1327	1512	WEIS				0705.0	1158.0					CONT
	0700	1158	WEIS				0705.0	1426.0	2				IS
	0714	1550	OURN				0714 E	0930	1				I,C,DC
			OURN				1116.5	1116.9	3				IIIG
	1135	2119	SGMR										
			CULG				2018	2200					IIIS,W
	2018	2400	CULG				2018	2214	1				IS,C
			CULG	2018	2108.5	1							FAST DRIFT
			CULG	2046.5	2047	1							IIIG
			CULG				2049.5	2050	1				IIIB
			CULG	2049	2049.5	1							IIIG
			CULG	2109		1							FAST DRIFT
	2153	2400	MANI										
			CULG				2200	2400					IIIN,W
			CULG				2214	2400	1				IS,C
			CULG				2347.5	2348	3				IIIB,U
13			CULG				0000	0715					IIIN,W
	0000	0715	CULG				0000	0111	1				IS
	0000	0900	MANI										
			CULG				0035.5		1				IIIB
			CULG	0047	0049	1							IIIG
			CULG				0111	0259	1				IS
			CULG	0211.5	0212	1							FAST DRIFT
			CULG				0259	0715	1				IS
			CULG	0339	0339.5	1							FAST DRIFT

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
13			CULG				0429	0429.5	1				UNCLF
			CULG	0601	0601.5	1	0601	0602	2				IIIG
			CULG				0626.5		1				IIIB
			CULG				0628	0629.5	2				IIIG
			CULG	0713.5	0714	2	0713.5	0714.5	2	0713.5	0714	1	IIIG
	0703	1510	WEIS				0713.7	0714.3	2				IIIG
	0714	1550	DURN				0714 E	0925	1				I
			DURN				0730.5	0730.6	2				IIIG
			WEIS				0731.1	0731.5	1				IIIG
			WEIS				0903.7	0903.9	2				IIIB
			WEIS				0917.2	0918.1	2				IIIG
			DURN	0926.6	0926.6	1							III,RS
	1136	2118	SGMR										
			WEIS				1204.8	1205.1	1				IIIG
			DURN	1302.7	1302.9	2							IIIG
			WEIS				1304.0	1306.0	2				IIIG
	2018	2400	CULG				2018	2400					IIIN,W
			CULG				2018	2051					IN,W
	2150	2400	MANI										
			CULG				2151.5		1				IIIB
			CULG				2159		2				IIIB
			CULG							2200.5		1	IIIB
			CULG				2203	2203.5	3	2203	2203.5	1	IIIG
			CULG				2204	2204.5	3	2204	2204.5	2	IIIB
			CULG				2207	2208.5	3	2207	2208	2	IIIG,V
			CULG				2210.5	2212	3	2210.5	2212	2	IIIG,V
			CULG				2212.5		1				IIIB
			CULG	2223.5	2400	1	2311.5	2400	1				IS
14			CULG				0000	0127					IIIS,W
	0000	0716	CULG	0000	0155.5	1	0000	0131	1				IS
	0000	0857	MANI										
			CULG				0127	0716					IIIN,W
			CULG	0232	0504		0131	0418					IN,W
			CULG				0418	0503					IS,W
			CULG	0504.5	0551	1							IS
			CULG	0551	0716								IN,W
			CULG				0657.5	0658	2				IIIB
	0714	1550	DURN				0714 E	1110	1				I
	0705	1509	WEIS				0803.0	1508.0	2				IS
			WEIS				0817.0	1004.0	2				IIIN
			WEIS				1024.4	1024.6	3				IIIG
	1138	2117	SGMR										
	2017	2225	CULG										
	2156	2400	MANI										
	2235	2400	CULG				2245	2246	3				IIIG,U
15			CULG				0000.5	0001					IIIG,W
	0000	0716	CULG	0000	0016								IS,W
	0000	0855	MANI										
			CULG				0027.5						IIIB,W
			CULG	0108	0240								IS,W
			CULG				0129	0251	1				IS
			CULG				0157						IIIB,W
	0718	1550	DURN										
	0918	1506	WEIS										
	0705	0913	WEIS				1059.5	1101.6	1				IIIG
	1139	2116	SGMR										
	2017	2400	CULG	2128	2140								IS,W
			CULG				2132						IIIB,W
	2200	2400	MANI										
			CULG	2232	2324	1							IS
			CULG				2306.5						IIIB,W
			CULG				2324	2400					IS,W
16	0000	0901	MANI										
	0000	0716	CULG	0009	0716		0000	0017					IN,W
	0709	1505	WEIS										
	0714	1150	DURN										
	1140	2115	SGMR										

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
16	1340	1550	DURN										
	2017	2400	CULG	2033	2041								IN,W
			CULG				2034						IIIB,W
			CULG	2058.5		1	2058.5		1				IIIB,U
	2200	2400	MANI										
			CULG				2231.5						IIIB,W,U
			CULG	2234	2301		2246	2255					IN,W
			CULG				2309	2309.5	1				UNCLF
			CULG	2341		1							FAST DRIFT
			CULG				2342	2342.5					IIIG,W
17	0000	0618	MANI										
	0000	0717	CULG				0204		3	0204		2	IIIB
			CULG				0323		1				IIIB,W
			CULG				0404						IIIB,W
			CULG				0518.5	0519.5					IIIG,W
			CULG				0539	0539.5	1				IIIG
	0623	0720	MANI										
	0711	1358	WEIS										
	0714	1550	DURN										
	0804	0852	MANI										
	1141	2115	SGMR										
	1405	1503	WEIS										
	2017	2400	CULG										
	2200	2400	MANI										
18	0000	0852	MANI										
	0000	0716	CULG										
	0714	1550	DURN										
	1143	2114	SGMR										
	0713	1502	WEIS				1226.6	1226.8	1				IIIG
	2018	2400	CULG				2040.5		1	2040.5	2041	1	IIIB
			CULG				2117.5	2118	1				IIIG
	2149	2400	MANI										
			CULG				2152.5	2153.5					IIIG,W
			CULG				2202.5	2203					IIIG,W
			CULG				2203	2203.5	2				IIIB
19	0000	0853	MANI										
	0000	0717	CULG				0009.5		1				IIIB
			CULG				0021.5	0023.5					IIIG,W
			CULG							0022	0022.5	1	IIIG
			CULG				0211.5	0223					IIIGG,W
			CULG				0218	0219.5	3	0218	0219.5	3	IIIG,V
			CULG	0223		1	0223		1	0223		1	IIIB
			CULG				0328		2				IIIB
			CULG				0332.5	0333					IIIG,W
			CULG				0358.5	0403					IIIG,W
			CULG				0401	0401.5	2	0401.5		1	IIIG
			CULG				0431	0432.5					IIIG,W
			CULG				0439.5	0442	2	0440.5	0441	1	IIIGG
			CULG				0530	0551					IIIS,W
	0712	1501	WEIS				0923.8	0928.5	3				IIIGG
			WEIS				1135.5	1135.6	1				IIIB
			WEIS				1257.2	1257.3	1				IIIB
			WEIS				1300.4	1304.3	2				IIIGG
	1144	2113	SGMR				1506.5	1507.8	1				IIIG
			SGMR				1727.0	1728.4	1				IIIG
			SGMR				1854.9	1855.1	2				IIIG
	2017	2400	CULG	2049	2051		2048.5	2050					IIIG,W
			CULG	2053.5	2054	1							IIIG
			CULG				2100.5	2102	1				IIIG
			CULG				2113.5		1				IIIB
			CULG				2115	2116	1				IIIG
			CULG	2127	2131	1							IIIG
			CULG				2127	2129					IIIG,W
			CULG				2128.5		1				IIIB
	2200	2400	MANI										
			CULG	2212	2213.5	1	2208.5	2215.5	1				IIIG
			CULG	2220.5	2222	1	2220.5	2222	1				IIIG

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
19			CULG				2221.5	2222	3				IIIG,U
			CULG	2224	2225	2	2224	2225	3	2224	2224.5	3	IIIG,U
			CULG				2225	2227.5					IIIG,W
			CULG	2239.5	2240	1	2239.5	2240.5	1				IIIG,U
			CULG	2243.5	2245	1	2243.5	2245	1				IIIG
			CULG	2358.5	2359.5	1	2358.5	2400	1				IIIG,U
20	0000	0855	MANI										
	0000	0717	CULG	0002	0002.5		0001.5	0002.5					IIIG,W
			CULG	0201	0202		0201	0206					IIIG,W,U
			CULG				0204		2				IIIB
			CULG				0206		2				IIIB
			CULG	0354	0355.5	1	0354	0355.5	1				IIIGG
			CULG				0357.5						IIIB,W
	0714	1545	DURN										
	0717	1044	WEIS										
	1046	1459	WEIS										
	1145	1351	SGMR										
	1837	2112	SGMR										
	2017	2400	CULG	2146	2147	1	2146	2147	2				IIIG
	2200	2400	MANI										
			CULG	2237.5		1	2237.5		1				IIIB
21	0000	0852	MANI										
	0000	0717	CULG				0029	0641					IIIN,W
			CULG	0036.5			0036.5						IIIB,W
			CULG				0140.5	0141	1				UNCLF
			CULG	0640.5	0641.5		0640.5	0641					IIIG,W
	0718	1500	WEIS										
	0714	1550	DURN				1140.5	1141.7	2				IIIGG
	1146	2112	SGMR										
	2018	2333	CULG				2026	2243					IIIN,W
			CULG	2029.5	2030	2	2029.5	2030	3	2030	2030.5	2	IIIG
			CULG	2031.5	2032.5	2	2031	2032.5	2	2032	2032.5	1	IIIG
			CULG				2112.5	2113	1				IIIG
	2200	2400	MANI										
			CULG				2225.5	2226	2				IIIB
			CULG				2225.5		2				IIIB
			CULG				2236	2237	2				IIIG
			CULG				2238.5		1				IIIB
	2346	2400	CULG										
22	0000	0855	MANI										
	0000	0718	CULG				0033.5	0543					IIIN,W
			CULG				0043		1				IIIB
	0714	1545	DURN										
	0718	1458	WEIS				1111.4	1111.5	1				IIIB
			WEIS				1219.4	1219.7	1				IIIG
			WEIS				1348.4	1348.7	2				IIIG
			WEIS				1407.7	1410.2	3				IIIG
	1148	2111	SGMR				1407.8	1410.0	2				IIIG
			WEIS				1443.6	1443.8	1				IIIG
			WEIS				1445.4	1445.7	2				IIIG
			SGMR				1445.5	1736.0	2				IIIS
	2018	2400	CULG				2018	2027					IW
			CULG				2056.5	2058	2				IIIG
			CULG				2101.5	2102	1				IIIG
	2158	2400	MANI										
			CULG				2304.5	2305	2				IIIG
			CULG				2305.5	2307	3	2306	2306.5	2	IIIG,V,U
			CULG				2314.5	2315.5	1				IIIG
23	0000	0700	MANI										
	0000	0715	CULG				0208	0208.5					IIIG,W
			CULG				0258.5						IIIB,W
			CULG				0419	0420	2				IIIG
	0714	1510	DURN										
	0720	0727	WEIS										
	0733	1457	WEIS										
	1149	2110	SGMR										

SOLAR RADIO EMISSION
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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
23	2018	2400	CULG				2101.5	2102	1				UNCLF
24	0000	0854	MANI										
	0000	0717	CULG	0009.5	0011.5		0010	0012					IIIG,W
			CULG	0022		1	0022	0022.5	1				IIIB
			CULG				0101	0102	1				IIIG
			CULG							0101	0101.5		IIIG,W
			CULG				0103.5	0105		0104.5	0105		IIIG,W
			CULG				0115	0115.5		0115	0115.5		IIIG,W
			CULG				0122.5	0123					IIIG,W
			CULG	0130	0130.5	1	0129.5	0130.5	1	0129.5	0130.5	2	IIIG
			CULG	0132	0133		0132	0133.5					IIIG,W
			CULG				0138	0138.5					IIIG,W
			CULG				0241		1				IIIB
			CULG	0245	0246	1	0244.5	0246.5	3	0245	0246.5	3	IIIGG
			CULG	0246.5	0248								IIIG,W
			CULG				0255.5	0257	2	0256	0257	2	IIIGG
			CULG	0442.5	0444	1	0443	0443.5	1	0443	0443.5	2	IIIG
	0714	0820	DURN										
	0720	1456	WEIS				1236.3	1236.8	2				IIIG
			WEIS				1238.2	1238.3	1				IIIB
			WEIS				1256.6	1257.3	2				IIIG
			WEIS				1329.3	1329.4	1				IIIG
			WEIS				1429.7	1430.0	2				IIIG
	1150	2110	SGMR				1429.8	1430.0	1				III
			WEIS				1443.4	1444.6	2				IIIG
	2017	2400	CULG	2124.5	2125	1	2124.5	2125.5	2	2124.5	2125.5	3	IIIG,V
			CULG				2127	2128	2	2127	2128	2	IIIG
			CULG	2147	2149	2							IIIGG
	2200	2400	MANI										
25	0000	0901	MANI										
	0000	0717	CULG				0003.5	0004.5	1				IIIG
	0723	1220	WEIS										
	0820	1540	DURN										
	1227	1455	WEIS										
	1151	2109	SGMR				1255.9	1256.0	2				III
			SGMR				1523.9	1524.5	2				V
	2018	2400	CULG				2116.5						IIIB,W
			CULG				2146	2147.5					IIIG,W
			CULG				2154	2154.5					UNCLF,W
			CULG				2156	2157					UNCLF,W
			CULG				2204		1				IIIB
	2212	2400	MANI										
26	0000	0857	MANI										
	0000	0719	CULG	0019.5		1	0019.5		1				IIIB
			CULG	0033.5	0034								IIIG,W
			CULG	0036.5	0037	2	0036.5	0037.5	2	0036.5	0037	1	IIIG,V
			CULG	0303	0303.5		0303	0303.5					IIIG,W
			CULG				0414						IIIB,W
			CULG	0519	0615								IN,W
	0720	1540	DURN										
	0724	1454	WEIS				0828.9	0829.7	2				IIIG
	1152	2108	SGMR										
	2019	2400	CULG				2022	2059					IN,W
			CULG				2059	2210	1				IS
	2200	2400	MANI										
			CULG				2210	2400					IS,W
			CULG				2213	2213.5	2				IIIG
			CULG				2214.5	2215.5	1				IIIG
			CULG				2216.5	2217	1				IIIG
27	0000	0858	MANI										
	0000	0719	CULG				0016	0017					IIIG,W
			CULG				0047.5	0048	1				UNCLF
			CULG	0111	0247								IS,W
			CULG				0244.5						IIIB,W
			CULG				0341	0341.5					IIIG,W
			CULG				0401	0521					IS,W

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NOV 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
27			CULG	0602	0606	1							FAST DRIFT
	0720	1540	DURN										
	0725	1401	WEIS										
	1420	1441	WEIS										
	1447	1453	WEIS				1449.0	1449.8	2				IIIG
	1154	2108	SGMR				1449.2	1454.4	3				IIIG
	2019	2400	CULG	2057	2059.5	1	2056	2059.5	3	2057.5	2058	1	IIIGG
			CULG				2102	2353					IIIN,W
			CULG	2148.5	2150	1	2145.5	2150	1				IIIGG
			CULG				2148.5	2149	2				IIIG
	2202	2400	MANI										
			CULG				2214.5	2216.5	3	2215	2216.5	2	IIIG
			CULG				2305.5	2306.5	1				IIIG
			CULG				2332.5		1				IIIB
28	0000	0719	CULG				0000.5	0001	2	0000.5	0001.5	1	IIIB
	0000	0857	MANI										
			CULG				0009.5		1				IIIB
			CULG	0038	0039.5		0038	0039.5					IIIG,W
			CULG				0040	0040.5	3				IIIB
			CULG				0043	0458					IIIN,W
			CULG				0044.5		1				IIIB
			CULG	0046	0141	1							IS
			CULG				0142		2	0142		1	IIIB
			CULG	0233	0234		0233	0233.5					IIIG,W
			CULG				0235	0236	2	0235.5	0236	1	IIIG
			CULG	0239.5		1							IIIB
			CULG				0248		1				IIIB
			CULG	0248	0341								IS,W
			CULG				0314	0317	3	0314	0317	3	IIIGG
			CULG	0330.5	0331	1							IIIG
			CULG	0341	0502	1							IS
			CULG	0448	0448.5	2							FAST DRIFT
			CULG	0502	0711	1							IS
			CULG				0529.5	0536					POSS II,W
			CULG	0530	0629	1	0540	0719	2				IV
			CULG				0531	0545					IIIS,W
			CULG				0542	0556	1				P
			CULG	0627.5	0630	2							FAST DRIFT
			CULG	0650.5	0651.5	1							FAST DRIFT
			CULG				0701	0702	1				IIIB
			CULG	0701	0711	1							IIIN
			CULG				0703.5	0704.5	3	0703.5	0704	1	IIIB,V
	0720	1539	DURN	0725.8	0725.9	1							IIIG,RS
			DURN				0806.4	0813.4	3				IIIG,N,RS
	0734	1040	WEIS				0809.3	0814.4	2				IIIGG
			DURN	0811.3	0813.9	2							IIIG,N
			DURN	0920.3	0920.6	1							IIIG,RS
			WEIS				1024.2	1032.8	3				IIIGG
			DURN	1027.6	1032.3	3	1026.6	1033.8	3				IIIGG
			DURN	1039.6	1039.7	3							IIIG
	1046	1453	WEIS				1049.6	1050.0	2				IIIG
			DURN	1050.7	1051.0	1	1050.6	1050.8	3				IIIG
			WEIS				1122.3	1124.6	3				IIIGG
			DURN	1123.4	1125.3	2	1123.2	1125.6	3				IIIGG
			WEIS				1132.7	1133.7	3				IIIGG
			DURN	1133.7	1134.7	3	1133.7	1134.8	3				IIIGG
			WEIS				1150.5	1152.7	2				IIIGG
			DURN	1151.5	1152.1	1	1151.5	1152.2	3				IIIGG
			WEIS				1203.4	1203.7	2				IIIG
			DURN				1204.5	1204.7	3				IIIG
			WEIS				1237.8	1238.2	2				IIIG
			DURN	1238.8	1239.0	3	1238.8	1239.0	3				IIIGG
			WEIS	1304.5	1304.7	1							IIIG
			WEIS				1405.7	1406.5	2				IIIG
	1155	2107	SGMR				1405.8	1406.5	1				IIIG
	2022	2400	CULG	2022	2400	1							IS
			CULG	2040.5	2041	2							IIIG
			CULG	2046.5	2048	2	2044	2048	1				IIIGG
			CULG	2103.5	2104	2	2103.5	2104.5	2				IIIG

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
28			CULG				2106	2226					IS,W
			CULG	2113	2113.5	1							IIIG
			CULG				2117	2117.5	1				IIIG
			CULG				2123.5		1				IIIB
			CULG	2132	2132.5	1							IIIG
	2200	2400	MANI										
			CULG	2215.5	2216	2							IIIG
			CULG				2226	2400	1				IS
			CULG				2234		1				IIIB
			CULG				2237		1				IIIB
			CULG	2334.5		1	2334.5	2335	2				IIIG
			CULG				2338.5						IIIB,W
			CULG				2341.5						IIIB,W
			CULG	2356.5	2357	1	2356.5	2357	1				IIIG
			CULG	2357.5	2358	1	2357.5	2358	1				IIIG
			CULG	2358	2358.5	2	2358	2358.5	2				IIIG
29			CULG				0000	0511					IS,W
	0000	0720	CULG	0000	0720	1							IS
	0000	0858	MANI										
			CULG	0021	0021.5	1	0021	0021.5	1				IIIG
			CULG				0310.5	0318					IIIG,W
			CULG				0508	0558					IIIS,W
			CULG				0511	0720	1				IS
			CULG							0514	0533	1	S.W.F.
			CULG				0517.5	0526	2				II HB
			CULG				0519	0550					POSS IV,W
			CULG				0523.5	0525	2				IIIG
			CULG				0532	0534	2				IIIG
			CULG				0542.5		1				IIIB
	0720	0918	DURN				0720 E	0918 D	1				I,C
			WEIS				0800.0	1450.0	1				IN
	0729	1451	WEIS				0947.7	0948.0	1				IIIG
	1000	1021	DURN				1000 E	1021 D	1				I,DC
			WEIS				1012.4	1017.3	2				IIIG,U
			WEIS				1041.4	1041.8	2				IIIG
			WEIS				1054.7	1055.6	2				IIIG
			WEIS				1108.8	1109.0	2				IIIG
			WEIS				1153.4	1153.6	1				IIIG
			WEIS				1213.2	1214.1	3				IIIG
			WEIS				1233.4	1234.3	2				IIIG
			WEIS				1242.5	1243.3	1				IIIG
			WEIS				1343.3	1343.6	2				IIIG
			WEIS				1402.4	1405.8	3				IIIGG
	1156	2107	SGMR				1403.3	1404.8	1				IIIG
			WEIS				1425.8	1426.2	2				IIIG
			WEIS				1428.2	1428.5	2				IIIG
			WEIS				1431.4	1435.6	3				IIIGG
			SGMR				1432.0	1434.2	2				IIIG
			SGMR				1523.2	1524.9	2				IIIG
			SGMR				1846.8	1847.3	2				IIIG
			SGMR				1937.2	1940.0	2				V
			SGMR				1944.8	1948.7	2				II
	2020	2400	CULG	2020	2400	1							IS
			CULG				2110	2400					IIIS,W
			CULG				2121	2400	1				IS,DC
			CULG				2137	2140.5	3				IIIGG
			CULG	2143	2143.5	1							IIIG
			CULG				2150.5	2152	3				IIIGG
			CULG	2153.5	2154	2	2153.5	2155	2				IIIG
			CULG				2206.5	2207	2				IIIG
			CULG				2209	2210	2				IIIG
			CULG	2213	2213.5	1	2213	2214	2				IIIG
			CULG	2216.5	2217	1	2216.5	2217	2				IIIG
			CULG	2218.5	2219	1	2218.5	2219	1				IIIG
			CULG	2226.5	2227	1	2226.5	2227	1				IIIG
			CULG				2229	2229.5	1				IIIB
			CULG				2238	2239	2				IIIGG
			CULG				2254.5		2				IIIB
			CULG	2257.5	2258	1	2254	2258	1				IIIGG

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
29	2205	2400	MANI							2337.8	2338.9	2	III
			CULG	2339.5	2341.5	1	2337.5	2341.5	3	2337.5	2339	3	IIIGG,V
30	0000	0720	CULG	0000	0720	1	0000	0534	1				IS
			CULG				0018	0019	2				IIIG
			CULG				0024.5	0025.5	2				IIIG,U
			CULG				0048	0641					IIIGN,W
			CULG				0107	0108.5	3				IIIG
	0000	0857	MANI							0117.4	0119.5	2	IIIG
			CULG	0117	0118.5	2	0117	0120	3	0117.5	0120	3	IIIGG,V
			CULG	0124	0124.5	2	0124	0125.5	1				IIIG
			CULG				0131.5		1				IIIB
			CULG	0154	0212	2							IV
			CULG				0158.5	0206	1				POSS II
			CULG				0201	0208	1				IV
			CULG				0345.5		2				IIIB
			CULG				0352	0352.5	1				IIIG
			CULG				0409	0410	2				IIIG
			CULG				0424		2				IIIB
			CULG				0430.5	0431.5	1				UNCLF
			CULG	0446	0447	2							IIIG
			CULG	0450.5	0451	2							IIIG
			CULG	0522.5		2	0522.5		1				IIIB
			CULG				0525	0526	2				IIIG
			CULG				0534	0552	2				IS
			CULG				0552	0720	1				IS
			CULG				0553.5	0555	3				IIIG,V
			MANI							0553.8	0554.0	1	III
			CULG	0601	0601.5	2							IIIG
			WEIS				0736.0	1444.5	2				I
	0731	1450	WEIS				0754.4	0756.7	3				IIIGG
			WEIS				0759.9	0801.8	1				IIIGG
			WEIS				0905.0	0906.8	3				IIIG
			WEIS				0927.3	0927.5	2				IIIG
			WEIS				0933.3	0933.7	3				IIIG
			WEIS				0937.1	0937.3	1				IIIG
			WEIS				0938.0	0938.6	2				IIIG
			WEIS				0944.5	0944.7	2				IIIG
			WEIS				1153.4	1154.6	2				IIIG
			WEIS				1244.0	1245.2	2				IIIG
			WEIS				1330.5	1332.2	2				IIIG
			WEIS				1420.0	1420.2	1				IIIG
			WEIS				1442.9	1443.3	2				IIIB
	1157	2107	SGMR				1801.9	1803.3	3				V
	2020	2400	CULG	2020	2400	1	2135	2400	1				IS
	2200	2400	MANI										
			CULG				2204	2400					IIIN,W
			CULG				2253.5		1				IIIB
			CULG				2311	2311.5	1				IIIG,U
			CULG	2316	2316.5	1	2316	2316.5	2				IIIG

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

Note: The 25-580 MHz solar radio burst observations are being continued at the Harvard Radio Astronomy Station at Fort Davis, Texas, but the preparation of data summaries will be delayed somewhat.

ERRATA: The Culgoora spectral data entry on 12 October 1978 in the metric band at 0150-0310 UT had an error in the Spectral Type. "IS,DC,C" should read "CONT,IS,DC". These data appear in SGD 412 Part I, page 139, December 1978 issue.

SELECTED SOLAR EVENTS

NOVEMBER 1978

Culgoora

UT Date 197Å November	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
1	0054	0055	43.25)	1.0	310)	-	2)	IIIG,U	*
			80)		)		)		
2	0218.		80)	.8	250)	-	2)	IIIB	*
			160)		)		1)		
	0311	0312	160	.9	105	-	2	IIIG	
3	0018	0230	160	1.3	270	R	2	IS	
	0040	0042	43.25)	1.4	300)		3)		* Type III
			80)	1.2	295)	-	3)	IIIG,V	activity from this
			160)	1.1	290)		2)		region also on 4th
	0350	0353	43.25)				)		
			80)	1.3	270	-	3)	IIIGG,V	*
			160)				)		
	0420	0425	43.25)	.6	100		3)		
			80)	.6	135		2)	IIIGG	*
			160)	.7	180		2)		
5/6	2300	0500	80)	.6	160	R to	2-3)	IS	Complex source
			160)			varying	)		Type I activity
	0045	0046	43.25)	1.2	)		)		persisted from
			80)	1.0	95)	-	3)	IIIG,V	5th to 10th.
			160)	.9	)		)		
6	2252.5	2253	43.25)	.3	120)	-	3)	IIIB	
			80)	.2	)		)		
7/8	2300	0500	160	.2	320	L to	2	IS	Type I activity
						varying			persisted until
8	0247	0253	43.25)	.6	335		)		10th.
			80)	.4	335	-	) 3	IIIGG	*
			160)	.2	325		)		
9	0203	0209	43.25)				)		
			80)	0	0	-	3)	IIIGG,U	*
			160)				)		
10	0110	0126	43.25)				)		Complex source.
			80)	0	0	-	3)	II	
			160)				)		
	0110	0126	43.25)	1.0	50	-	3	) II	Complex source
			80)				)		

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

UT Date 197Å November	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
10	0126	0220	43.25)						
			80)	0	0	-	3	IV	Complex source
			160)						
10/11	2300	0500	43.25)						Complex source
			80)	.3	355	L	2	IS	Continued until
			160)						17th.
12	2347.5	2349	43.25	1.2	280	-	3	IIIB,U	
14	2245	2246	43.25)				3)		
			80)	1.1	310		2)	IIIG,U	
			160)				1)		
15	0000	0001	80)	.2	90		2)	IIIG,W	
			160)				)		
17	0203.5	0204	43.25)				3)		
			80)	.9	90		2)	IIIB	
			160)				1)		
19	0217	0223	43.25)	.3	) 130		3)		
			80)	.9	)		3)	IIIG	*
			160)	1.0	115		2)		
19/20	2358	2400	80)	.8	190		2)	IIIG,U	Type III activity
			160)				)		persisted from
	0204		43.25)	.4	)		3)		this region also
			80)	.8	) 190		2)	IIIB	on 22nd.
			160)	.8	)		2)		
22	2305	2307	80)	1.2	) 50		3)	IIIG,V,U	*
			160)	1.1	)		1)		
23	0419	0420	43.25)	1.0	120		3	IIIG	Type III activity
			80)						persisted from
24	0244.5	0246	43.25)		)				this region also
			80)	1.0	) 235	-	3	IIIGG	* on 22nd, 24th.
			160)		)				
26	0019.5		43.25)		)				
			80)	.8	) 90			IIIB	*
			160)		)				

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

NOVEMBER 1978

Culgoora

UT Date 197.8 November	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
27	2305.5	2306.5	43.25)	1.1	)		2)		
			80)	1.1	) 240		2)	IIIG	*
			160)	1.0	)		1)		
	0247	0251	43.25)		)		)		
			80)	1.0	) 110		2)	IIIG	*
			160)		)		)		
	0313.5	0317	43.25)	1.3	)		3)		
			80)	1.2	) 320		3)	IIIGG	*
			160)	1.1	)		1)		
28/29	2300	0500	160	1.0	310	0-ℓ	2	IS	Type I activity
29/30	2300	0500	160	1.0	90		2	IS	from this region
	0115	0120	43.25)		)		)		persisted until
			80)	.8	) 160		3)	IIIGG,V *	30th.
			160)		) 160		)		
	0159	0200	43.25)	.8	) 160		2)	Possible	II
			80)		)		3)		

Days without Heliograph observations: ..Nil.....

* Other type III's observed from same position during the day.

COSMIC RAY INDICES

COSMIC RAY INDICES

(Neutron Monitors)

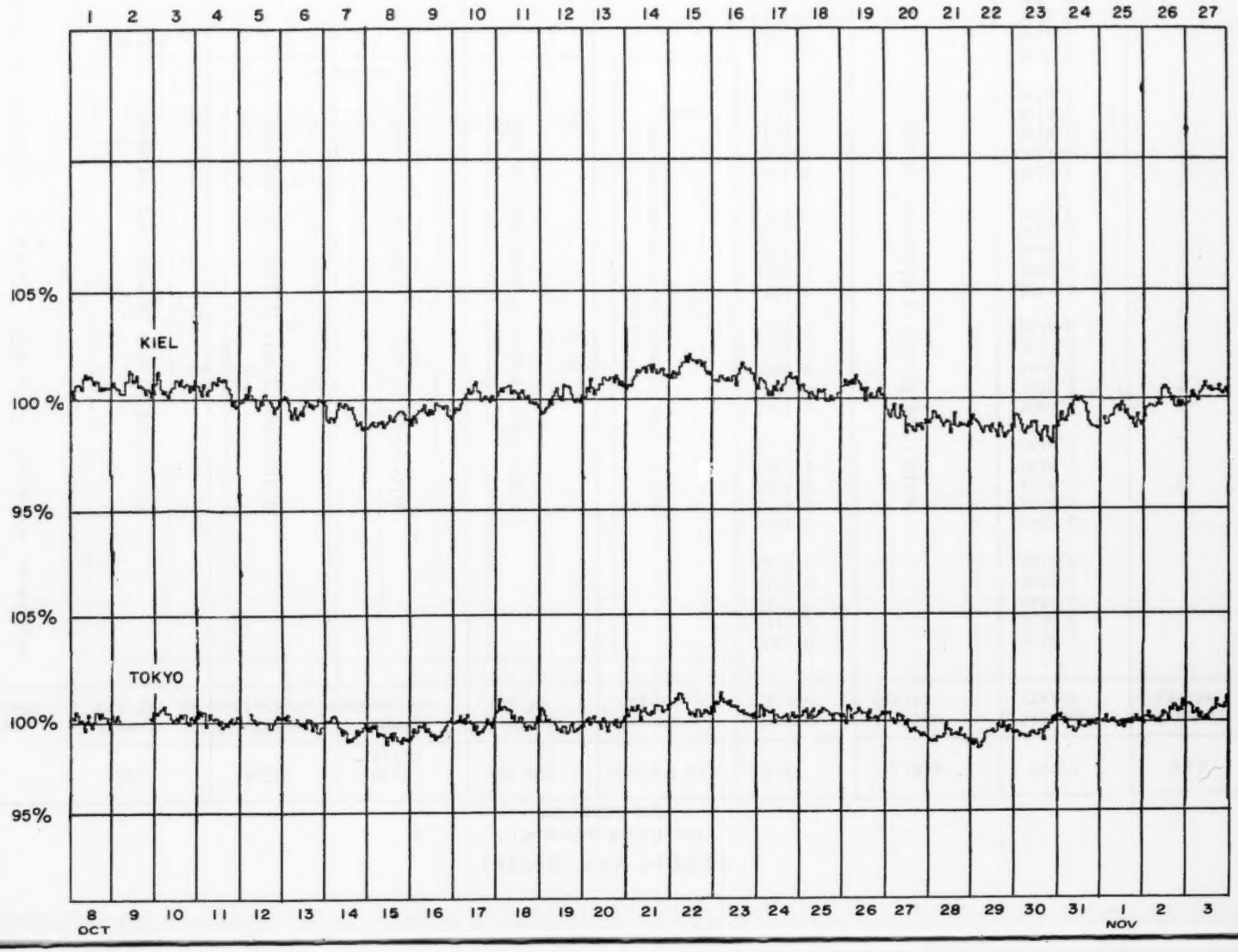
NOVEMBER 1978

Nov. 1978	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT. Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA Average cts/hr
1						6065.8		3622.9	
2						6113.4		3636.8	
3						6143.5		3644.6	
4						6182.8		3647.7	
5						6210.8		3652.2	
6						6229.8		3648.2	
7						6254.6		3654.3	
8						6231.0		3655.7	
9						6247.3		3658.5	
10						6247.2		3648.2	
11						6251.2		3660.0	
12						6077.9		3609.8	
13						6050.4		3599.9	
14						6079.5		3616.6	
15						6135.5		3636.6	
16						6196.3		3644.4	
17						6185.3		3648.7	
18						6211.6		3646.3	
19						6209.7		3645.5	
20						6165.0		3629.6	
21						6141.4		3615.7	
22						6098.0		3621.9	
23						6104.7		3614.2	
24						6105.2		3618.0	
25						6084.0		3616.3	
26						6143.8		3616.3	
27						6189.2		3617.7	
28						6196.0		3632.0	
29						6215.1		3641.8	
30						6232.2		3639.5	
MEAN						6166.6		3634.7	

Data not available at time of publication

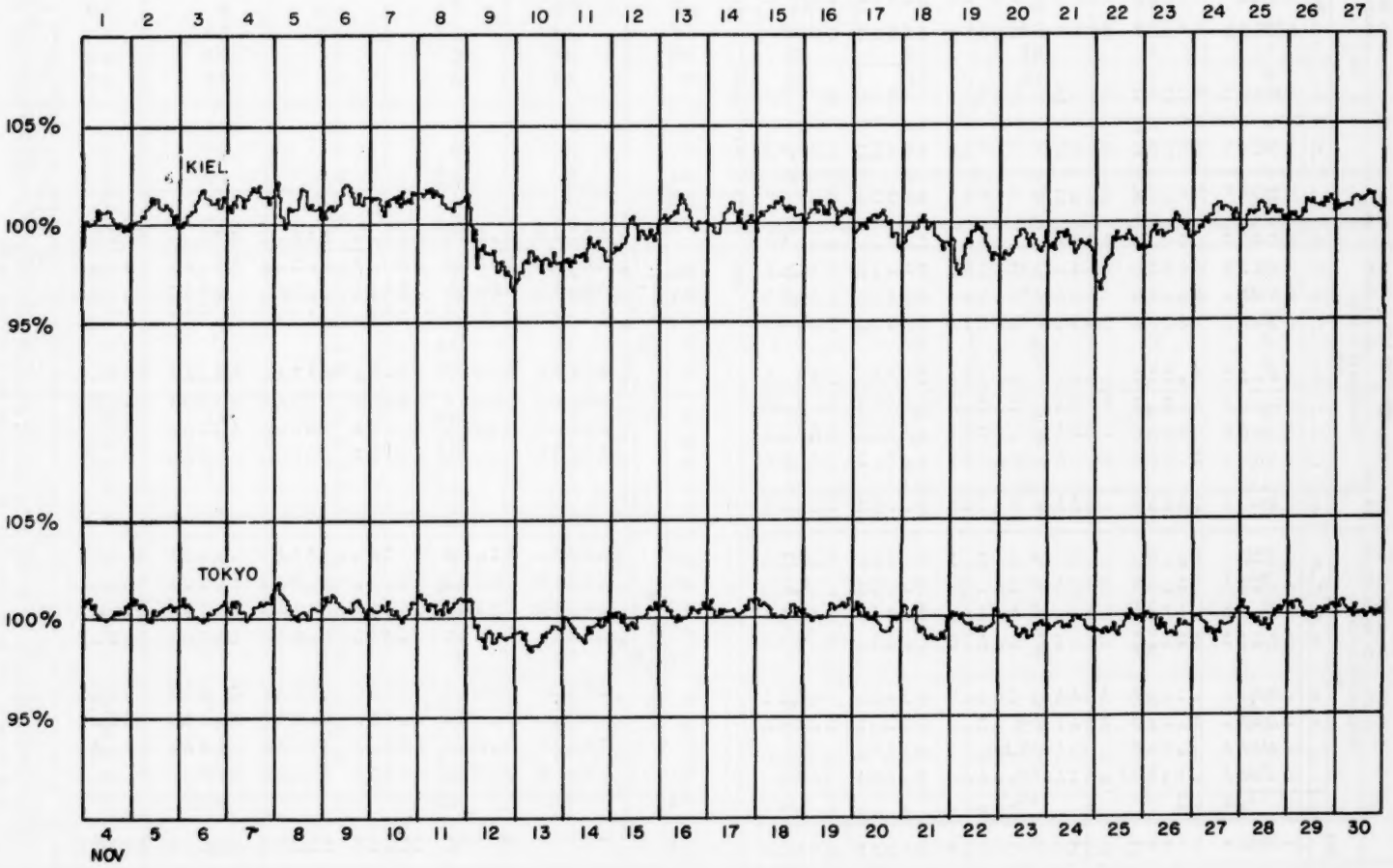
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1985 (October-November 1978)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1986 (November 1978)



GEOMAGNETIC ACTIVITY INDICES

NOVEMBER 1978

Day		Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa				Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M		
1		2+	3	3+	4	2+	2	2	2+	21+	2	2+	3	4-	2+	2+	2	2+	13	18	20	22 16		0.7
2		1-	2-	2	3+	3+	3+	2	2	18+	1-	1	2	3+	4-	3+	2	2+	10	18	30	17 30		0.6
3		3-	3-	3-	2+	2-	2	4-	3+	21	2+	2+	2	2	2-	2	4-	3+	12	22	20	19 24		0.7
4	Q6	2+	2-	2+	1-	1+	1-	0+	2-	11	2	2+	2	1-	2-	1+	1-	2-	5	9	15	14 11	C	0.2
5	Q8K	3-	3+	1	1	1+	1+	1-	0	11+	2+	3-	1+	1+	2-	2-	0+	0+	6	12	10	17 6	CC	0.3
6	Q1	0	0	0+	1	1-	1	1-	1-	4+	0+	0	1-	1-	1	2-	1	1	2	4	8	4 7	CC	0.0
7	Q0A	1-	0	0	0+	0+	1-	3-	5	10-	1	0	0	0	1-	2-	3-	4+	9	19	11	3 27		0.5
8		4+	4+	3-	2	2-	3-	2	2	22-	4-	3+	2+	2+	2-	3	2+	2	14	22	27	34 16		0.8
9		3-	3-	3	2	2	1+	0	1-	14+	2+	2	3	2-	2	1+	0+	1	8	15	15	21 10		0.4
10		1+	1	0+	1+	1+	4-	5-	5	19-	2-	2-	0+	1+	2	4	5-	4+	16	34	31	9 57		0.9
11		3	3	2+	1-	1	1-	3+	3	17	3-	2	2+	1	1	1	3	3-	10	22	11	16 17		0.6
12	D2	6-	4	6-	6	5+	4-	5+	5	41-	5	4-	5+	6	5	4-	5-	4+	53	87	68	97 77		1.6
13		4+	4	3-	2+	4	4+	4+	1+	27+	4-	3+	2+	3-	4-	4-	4-	2-	22	38	27	27 38		1.1
14		1-	0+	1-	1-	4+	4	3-	1+	15-	0+	0+	1-	1	4-	4-	3	2-	11	17	18	4 31		0.6
15		2	3+	2	2	0+	2-	2	2+	16-	2-	3-	2-	2	0+	2-	2+	2+	8	15	13	16 12		0.4
16	Q9	2	1	2-	2-	3-	1+	2+	1-	13+	2-	1	1+	2	3	2-	2+	1	6	9	15	11 14	CC	0.3
17	Q7	2	0+	2+	2+	2	1	2-	1	13-	2-	0+	2	3-	2-	1-	2	1+	6	9	12	11 10	CC	0.3
18	Q5	2-	2	1+	1	1-	1-	1	2+	11-	1+	1+	1+	1-	1-	1+	1+	3-	5	8	10	10 9	CK	0.2
19		3-	4-	2	3	4-	3-	1	2	21-	2+	3-	2	3-	4-	3	2-	3-	13	19	25	24 20		0.7
20	D5	3	4+	3	3-	3+	4	4	4+	29-	3	4-	3	3-	3+	4	5-	4-	22	35	44	31 48		1.1
21		4+	4-	3+	3-	2-	2+	2	4-	24-	3	3	3-	2+	2-	2+	2+	3+	16	27	17	26 19		0.9
22	D4	4	4-	4+	4-	5	5	3	2+	31	3	3-	3+	3+	5-	5-	3-	2	28	45	38	34 49		1.2
23		2-	1-	1	3	4-	3+	3	3-	19	1+	1-	1-	2+	3+	3+	3	3-	12	20	23	10 34		0.7
24		2+	3-	2	2-	4-	4-	4+	4+	25-	2	2	2-	2-	3+	4-	4+	4	18	29	32	14 48		1.0
25	D1	4-	4	4+	5	6	7	6+	5	41+	3-	3	4-	5	6	6+	6-	4	60	81	81	43 120		1.7
26	D3	5-	5	5-	4	4+	4+	4	3+	34+	4-	4+	4-	4-	4+	5-	4-	3	33	45	41	41 45		1.3
27		3-	3+	3	3	3	4-	4	3	26-	2+	2+	2	3-	3	4-	4-	3	17	30	30	20 41		0.9
28	Q2	2-	2-	1+	1-	1+	2-	1	1-	10	1	1+	1-	0+	2	2	1	1	5	6	6	7 5	C	0.2
29	Q3	1+	1	0+	2	1-	2+	1	0+	9	1+	1-	0	2	1	2+	1	0+	4	8	8	9 7	CC	0.2
30	Q4	2	1+	0+	1-	1+	1-	2-	2+	10+	2-	1+	0+	1-	1	1+	2+	3-	5	11	11	7 14	KK	0.2
																		Mean	15	24.5	24.6	24.7		0.68

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	2	2+	3	4-	3-	3-	2	2+	2-	3-	3	4-	2+	2+	2	2+
2	1-	2-	2-	3+	4	3	2	2	1-	0+	2+	3+	4-	3+	2+	3-
3	2	2-	2+	2+	1	2	4-	3+	2+	3-	2-	2-	2	2	4-	3
4	2	2-	2	1-	2-	1+	0+	1+	2+	3-	2	1	2-	1+	1	2
5	3-	3-	1	1	2	2-	0+	0	2+	3-	1+	2-	1+	2-	1-	0+
6	0	0	0+	1	1	2-	1	1-	1	0+	1	0+	1+	2	1-	1+
7	1-	0	0	0	0	1+	3-	4+	1	0	0	0	1	2-	3	4
8	3+	3+	2	2	1+	3-	2+	2	4	4-	3-	3-	2-	3	2+	2+
9	2+	2-	3-	2-	2-	1+	0+	1-	2+	2+	3	2	2+	1+	0+	1+
10	1+	1+	0+	2-	2-	4-	5-	4+	2	2-	1-	1+	2+	4+	5-	5-
11	3-	2+	2	0+	1	1	3-	3-	3-	2	2+	1+	1	1	3	3
12	5-	3+	5	6-	5	4-	4+	4	6-	4	6-	6+	5+	4-	5-	5-
13	3+	3+	2+	3-	4-	4	4	1+	4	3	2	3	4-	3+	3	2
14	0+	0	0+	1-	4-	4-	3	2-	1-	1-	1	1+	4-	4-	3	2
15	2-	3-	2	2	0+	2-	2	2	2-	2+	2-	2	0	2-	2+	3-
16	2-	1-	1+	2-	3-	2-	2	1-	2	1+	1+	2	3	2	3-	1+
17	2-	0+	3-	2+	2	1-	2	1+	1+	0+	1+	3-	2-	1	2	1+
18	1+	1+	1+	0+	0+	1-	1+	2+	1+	2-	1+	1+	1	1+	1+	3+
19	2+	3-	1+	3	4-	3-	2-	2+	2	3	2+	3-	4-	3+	2	3
20	3-	3+	2+	3-	3+	4-	4+	4-	3	4	3+	3	3	4	5-	4-
21	3+	3	3-	2+	2-	2+	2+	3	3	3-	3	2+	2-	2+	2+	3+
22	3+	3-	4-	3	5-	5-	3	2	3	3	3-	4-	5	5-	3-	2+
23	1+	0+	1-	2+	3+	3+	3+	3	1+	1	1	2	3+	3+	3	3-
24	2	2-	1+	2-	3+	4-	4	4-	2-	2	2	2-	3+	4-	5-	4
25	3	3-	4-	5+	6	6	6-	4+	3-	3	4-	5-	6+	6+	6	4
26	4-	5	4	4-	4+	5-	4-	3-	4-	4-	3+	4-	4	5-	4-	3+
27	2	3-	2+	3	3	3+	4-	3	2+	2-	2-	2+	3-	4	4-	3
28	1	1	1-	1-	2+	2	1-	0+	1	1+	1-	0+	2-	2-	1	2-
29	1	0+	0	2	1	3-	1	0+	2-	1-	0+	2-	1	2+	1	0+
30	2-	1-	0+	1-	1+	2-	2	2+	2-	2-	0+	0+	1-	1+	3-	3

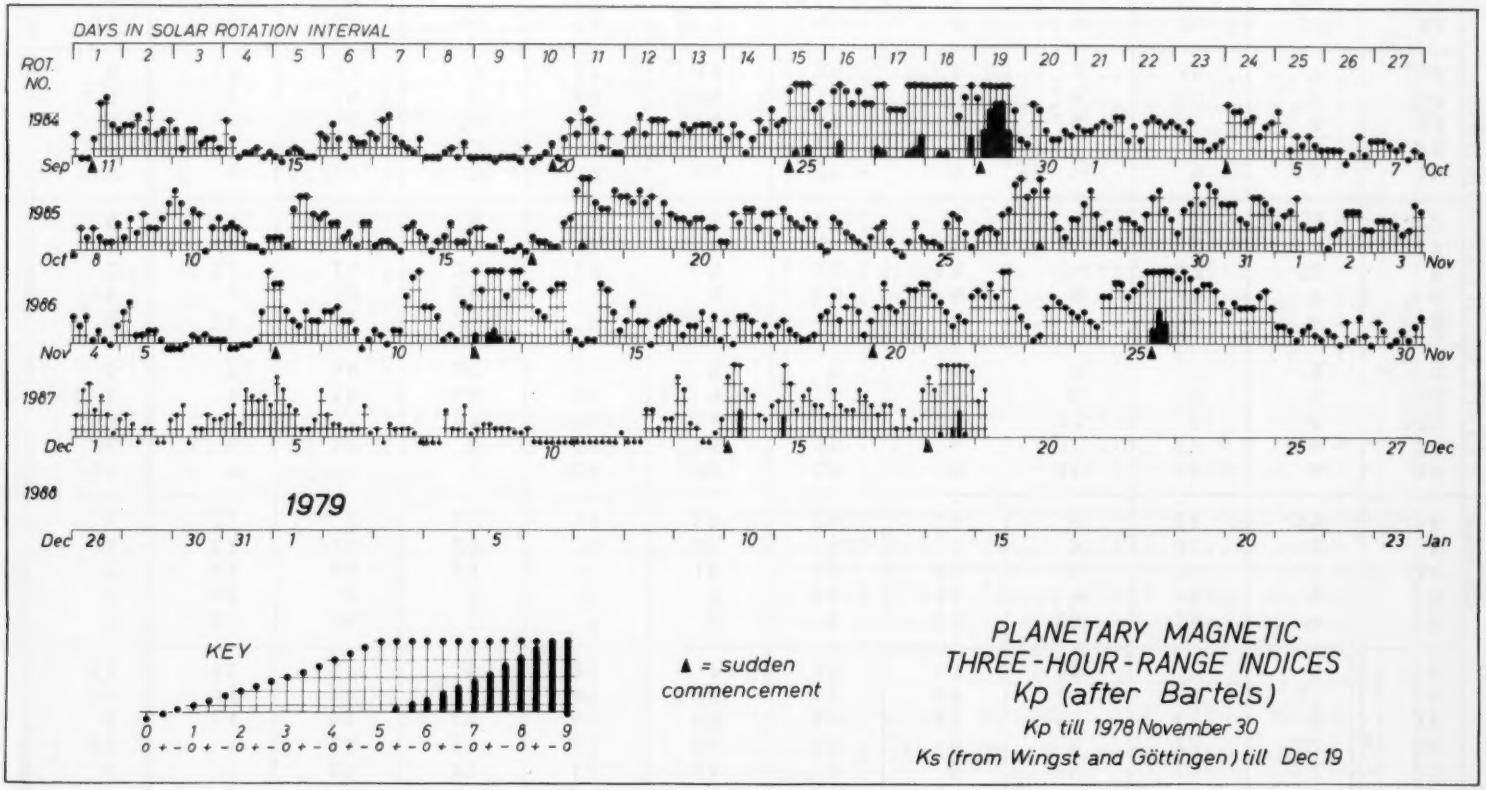
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap <6 but one Kp >3o or two Kp values >3-"). An * means "not really disturbed" (Ap<20).

Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

DAILY AVERAGE INDICES Ap

	1977	1978										
DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	6	7	15	33	12	88	9	6	4	21	13	13
2	69	8	14	27	15	94	82	5	4	20	12	10
3	9	13	14	15	41	83	31	11	16	11	8	12
4	14	89	11	3	55	96	26	80	30	8	17	5
5	18	31	17	6	21	7	38	53	22	7	8	6
6	5	34	14	7	9	5	8	13	16	14	4	2
7	3	13	7	9	5	7	11	14	7	6	4	9
8	2	19	10	20	5	16	10	14	6	24	5	14
9	3	23	16	14	6	85	4	8	5	31	11	8
10	4	21	7	12	36	10	24	10	6	12	15	16
11	38	7	5	7	64	30	17	6	11	12	5	10
12	21	4	10	3	29	18	10	4	21	13	14	53
13	16	8	8	12	24	11	7	20	13	6	8	22
14	8	3	11	10	51	9	4	48	6	5	5	11
15	5	2	48	17	19	5	6	6	3	3	5	8
16	9	14	11	24	8	7	6	6	4	6	4	6
17	12	9	10	25	7	8	9	6	9	8	5	6
18	3	12	10	24	19	5	11	18	24	3	32	5
19	3	6	12	15	38	4	17	11	11	2	22	13
20	4	3	12	9	23	8	11	5	3	5	9	22
21	6	1	12	7	9	26	33	6	6	9	13	16
22	6	3	22	13	8	24	15	8	6	12	10	28
23	4	2	6	15	22	24	18	8	4	11	6	12
24	5	6	5	6	48	26	19	6	4	10	5	18
25	5	12	12	3	17	10	24	8	9	36	7	60
26	11	12	37	49	18	7	46	5	4	36	18	33
27	6	5	42	70	16	5	15	4	29	51	23	17
28	10	9	46	17	12	7	12	6	124	50	14	5
29	8	36		14	6	8	32	4	40	109	16	4
30	5	36		16	58	18	31	3	31	11	25	5
31	6	23		8		12		2	45		20	
MEAN	10	15	16	16	23	25	20	13	17	18	12	15

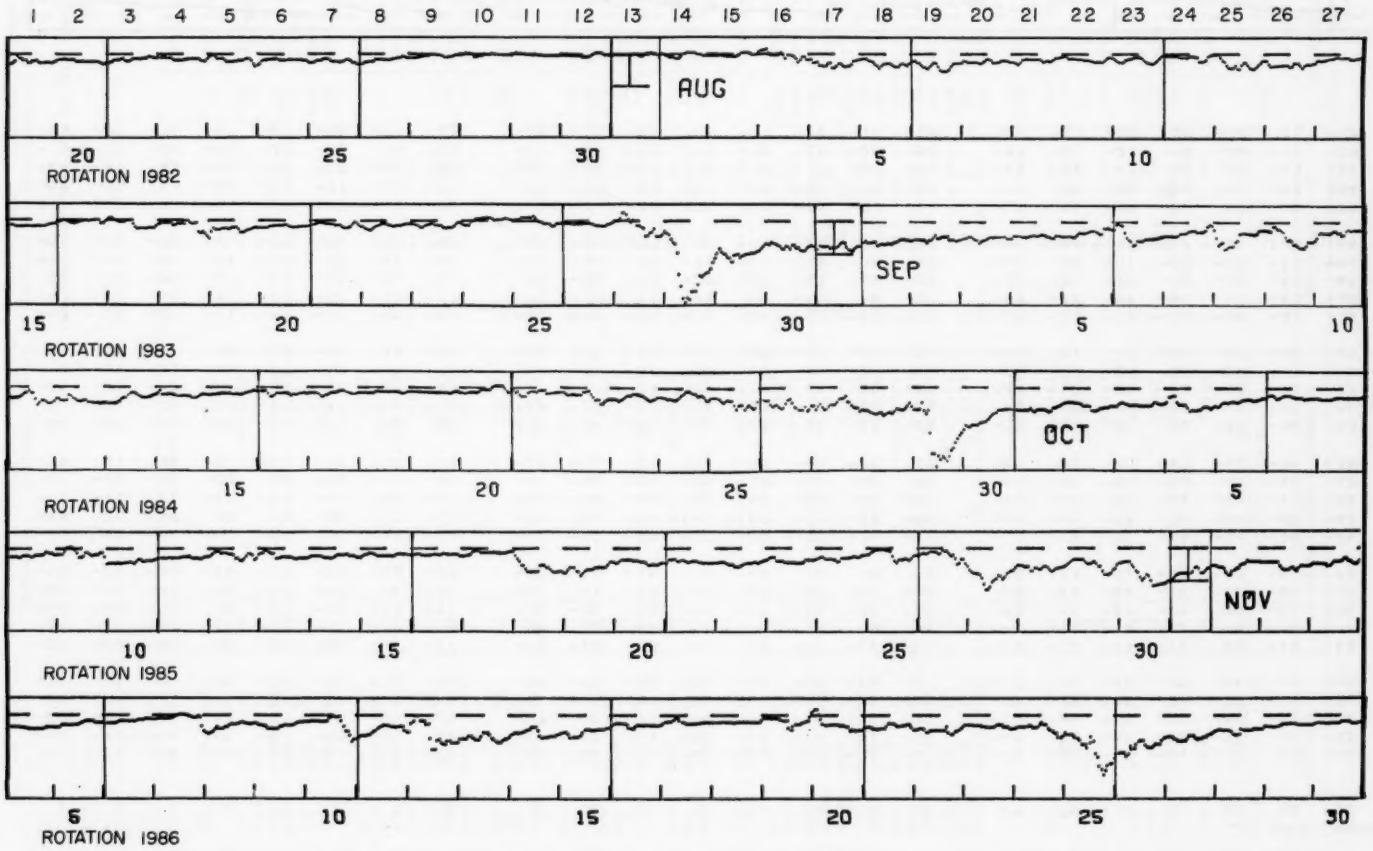
GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst

by Bartels Rotation



Note: Both the sensitivity indicator placed on the last day of the month and the zero reference level change from month to month.

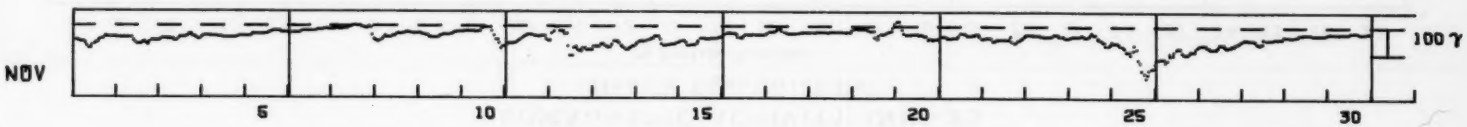
HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

NOVEMBER 1978

NASA/GODDARD SPACE FLIGHT CENTER

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-57	-57	-58	-60	-62	-61	-65	-76	-83	-80	-70	-65	-61	-59	-52	-47	-45	-38	-43	-44	-42	-41	-44	-44
2	-46	-46	-44	-44	-46	-42	-42	-44	-47	-57	-63	-68	-67	-64	-61	-57	-66	-71	-61	-53	-54	-56	-55	-53
3	-50	-45	-45	-48	-50	-49	-48	-51	-55	-53	-47	-40	-40	-39	-39	-37	-30	-29	-39	-42	-46	-50	-47	-40
4	-36	-34	-37	-39	-37	-38	-39	-41	-41	-42	-43	-45	-46	-45	-45	-45	-45	-42	-40	-38	-36	-36	-36	-37
5	-38	-38	-36	-29	-33	-31	-31	-32	-32	-29	-28	-29	-25	-22	-19	-17	-17	-19	-16	-25	-24	-25	-25	-28
6	-29	-28	-24	-25	-26	-26	-21	-17	-18	-18	-18	-18	-18	-17	-19	-15	-13	-13	-14	-11	-12	-11	-13	-13
7	-12	-11	-10	-12	-13	-11	-10	-10	-9	-5	-2	1	2	0	-1	-1	-6	-10	-12	-12	-3	-10	-37	-50
8	-56	-60	-53	-50	-44	-36	-43	-44	-39	-36	-36	-30	-27	-28	-27	-26	-23	-21	-27	-29	-30	-31	-26	-24
9	-29	-33	-34	-36	-37	-42	-44	-39	-45	-41	-39	-34	-33	-30	-30	-34	-33	-29	-26	-22	-20	-20	-19	-20
10	-19	-18	-16	-19	-22	-22	-23	-23	-22	-18	-10	-6	-2	-9	-8	-4	-20	-37	-51	-53	-63	-83	-72	-70
11	-66	-61	-62	-61	-60	-58	-54	-49	-46	-40	-36	-33	-30	-33	-34	-37	-38	-39	-37	-34	-33	-38	-49	-54
12	-55	-26	-19	-2	-2	-20	-17	-22	-29	-26	-74	-106	-107	-77	-72	-86	-89	-91	-78	-76	-86	-85	-83	-86
13	-73	-70	-71	-72	-63	-64	-70	-75	-78	-74	-64	-53	-55	-55	-62	-71	-76	-81	-86	-84	-76	-71	-70	-66
14	-61	-55	-52	-53	-53	-52	-49	-47	-44	-42	-36	-36	-38	-50	-65	-71	-66	-67	-65	-63	-67	-66	-60	-57
15	-54	-51	-51	-61	-69	-68	-65	-65	-65	-62	-54	-44	-43	-46	-48	-47	-46	-42	-43	-47	-46	-39	-38	-36
16	-33	-27	-24	-26	-29	-30	-30	-33	-41	-44	-46	-36	-31	-31	-35	-35	-30	-31	-33	-33	-34	-34	-33	-30
17	-26	-21	-20	-20	-19	-14	-9	-12	-19	-25	-27	-30	-32	-30	-28	-26	-26	-25	-24	-22	-24	-25	-24	-25
18	-25	-23	-22	-24	-21	-22	-26	-26	-26	-27	-24	-21	-22	-24	-24	-23	-21	-22	-26	-23	-22	-23	-23	-15
19	-9	-11	-13	-14	-11	-11	-14	-15	-16	-21	-18	-20	-42	-48	-35	-28	-29	-30	-24	-21	-19	-17	-6	8
20	15	13	-1	-15	-29	-34	-34	-34	-29	-30	-32	-28	-35	-34	-35	-38	-39	-51	-44	-49	-52	-45	-45	-46
21	-40	-36	-37	-41	-45	-46	-45	-40	-43	-42	-35	-26	-26	-28	-31	-37	-36	-33	-32	-31	-28	-31	-39	-47
22	-47	-42	-40	-43	-46	-54	-52	-47	-51	-46	-45	-48	-48	-49	-48	-36	-57	-62	-57	-50	-48	-43	-38	-33
23	-30	-29	-29	-33	-35	-34	-35	-36	-38	-38	-40	-37	-38	-38	-35	-29	-33	-34	-38	-38	-38	-44	-45	-43
24	-38	-36	-38	-37	-37	-35	-31	-37	-41	-40	-36	-29	-23	-32	-34	-42	-48	-52	-57	-60	-70	-72	-64	-56
25	-62	-60	-58	-65	-70	-74	-79	-90	-92	-91	-100	-84	-64	-82	-119	-130	-157	-166	-183	-168	-151	-146	-144	-131
26	-117	-113	-112	-114	-116	-127	-117	-93	-105	-99	-88	-78	-75	-76	-90	-99	-99	-101	-93	-86	-90	-90	-76	-69
27	-65	-63	-63	-68	-73	-77	-81	-79	-77	-79	-72	-62	-65	-64	-70	-76	-70	-70	-66	-66	-61	-58	-54	-49
28	-47	-44	-45	-49	-50	-45	-47	-53	-61	-64	-62	-58	-42	-49	-45	-48	-48	-44	-41	-45	-45	-44	-41	-34
29	-34	-38	-39	-40	-37	-35	-34	-32	-27	-26	-28	-25	-26	-28	-30	-33	-33	-31	-33	-30	-29	-30	-29	-26
30	-23	-22	-25	-27	-27	-28	-25	-23	-25	-25	-26	-23	-19	-19	-18	-18	-24	-28	-28	-26	-23	-21	-22	-24



NOTE: Starting May 1978, hourly values of the provisional Dst index have been based on data from Hermanus, Kakioka, and San Juan only, because the magnetometer at Honolulu has not been operated.

PRINCIPAL MAGNETIC STORMS

NOVEMBER 1978

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	COMMENCEMENT hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	UT END HOUR
HYB	07.6N	2	0700	..	..	..	..	02(5,6) 03(7)	4	2	138	20	04	07
HUA	00.6S	7	1403	..	..	..	..	07(8)	6	7	283	55	07	24
HYB	07.6N	8	0153	SC	- .6	+15	- 2	08(2)	4	3	68	19	09	09
GUA	04.0N	8	0152	SC	--	+45	-13	08(1)	5	--	80	40	09	09
HUA	00.6S	8	0152	SC	1	29	3	08(6)	6	7	255	37	08	21
HYB	07.6N	10	0600	..	..	..	..	10(7)	6	3	138	24	11	09
HER	33.7S	10	1500	..	..	..	..	10(6,8)	5	17	78	96	11	15
GNA	43.3S	10	15--	..	..	..	..	10(7)	6	16	100	80	11	02
KGL	56.5S	10	10--	..	..	..	..	10(8)	7	--	--	--	11	10
KGL	56.5S	11	2009	SC*	--	--	--	12(4)	7	--	--	--	13	21
COL	64.6N	12	0100	SC*	..	+289	-62	12(3,4,5) 13(6,7)	6	225	1630	1100	13	20
NEW	55.1N	12	0101	SC	3	53	6	12(3,4)	6	32	278	232	13	21
WIT	54.2N	12	0100	SC*	-10 *	+47		12(1,7,8)	6	43	165	60	13	20
FRD	49.6N	12	0101	SC	--	--	--	12(5)	6	24	133	57	15	13
SJG	29.9N	12	0100	SC	+ 2	+26	+ 7	12(4)	6	12	70	18	13	06
HYB	07.6N	12	0101	SC	- .7	+17	- 1	12(4,5)	7	5	274	30	13	22
GUA	04.0N	12	0100	SC*	+ 1	+62	-19	12(4)	7	--	240	40	13	20
HUA	00.6S	12	0101	SC	1	49	8	12(5)	7	14	319	47	13	20
PMG	18.6S	12	0100	SC*	- .8*	+40	+30	12(4)	7	6	230	130	13	18
HER	33.7S	12	0101	SC	+ 6	+34	+27	12(4)	7	36	176	163	14	01
GNA	43.3S	12	0100	SC*	-13.6*	-13 *	-52 *	12(1)	7	31	160	190	13	21
TOO	46.7S	12	0101	SC*	- 6.5*	+13 *	+ 6	12(3,4)	6	22	210	85	13	19
KGL	56.5S	12	0100	SC*	--	--	--	12(4)	7	--	--	--	13	21
NEW	55.1N	14	10--	..	..	..	..	14(5,6)	5	23	62	71	16	04
NEW	55.1N	18	2340	SC	2	13	--	19(5) 22(3,5)	5	36	115	168	23	01
HYB	07.6N	18	2300	..	..	..	..	19(5)	5	3	136	19	19	19
HUA	00.6S	18	2340	SC	--	12	3	20(5,6)	6	12	315	--	20	23
HYB	07.6N	19	2200	..	..	..	..	22(5,6)	5	4	132	27	22	22
GUA	04.0N	19	2320	SC	--	+17	- 5	20(1)	5	--	150	30	21	11
GNA	43.3S	19	2320	SC*	- 3.2*	+ 5	-11 *	20(8)	5	19	60	90	21	12
KGL	56.5S	19	2320	SC*	--	--	--	20(7,8)	5	--	--	--	22	05
KGL	56.5S	19	1155	SC*	--	--	--	20(7,8)	5	--	--	--	22	05
COL	64.6N	22	05--	..	..	..	..	22(5,6)	7	207	1370	850	22	24
HUA	00.6S	22	1138	..	..	..	..	22(5,6)	6	10	266	39	24	00
HER	33.7S	22	1454	SC	- 2	+ 7	+ 5	22(6)	5	24	78	65	24	03
COL	64.6N	24	09--	..	..	..	..	25(5)	9	719	2300	1730	27	23
NEW	55.1N	24	08--	..	..	..	..	25(4,5)	7	70	291	284	28	01
FRD	49.6N	24	14--	..	+ 2	+44	- 6	25(4)	6	22	186	85	27	23
SJG	29.9N	24	0900	..	..	..	..	25(6)	6	12	172	42	26	12
HYB	07.6N	24	0600	..	..	..	..	25(5,6,7)	7	5	288	27	27	23
TOO	46.7S	24	14--	..	..	..	..	25(5,6)	6	31	220	110	26	23
KGL	56.5S	24	13--	..	..	..	..	24(7)	7	--	--	--	25	01
WIT	54.2N	25	1222	SC*	+ 1	+13 *		25(6,7)	7	48	340	195	26	23
HUA	00.6S	25	1224	SC*	1	45	2	25(6,7)	7	14	420	76	26	22
PMG	18.6S	25	03--	..	..	..	..	25(5)	6	7	130	60	26	21
HER	33.7S	25	1223	SC*	- 2	+10	+ 5	25(6)	7	43	166	222	28	01
GNA	43.3S	25	05--	..	..	..	..	25(6)	7	32	140	140	26	23
KGL	56.5S	25	1225	SC	--	--	--	25(5,6)	8	--	--	--	26	15
IRK	41.0N	26	1200	..	..	..	..	26(7)	5	16	165	53	27	19
IRK	41.0N	29	0900	..	..	..	..	29(6) 30(6,7)	5	29	99	44	30	23

Reports were received from the following observatories:

College Fredericksburg Gnangara Guam Hermanus Hyderabad
Kerguelen Newport Port Moresby San Juan Toolangi Witteveen

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

NOVEMBER 1978

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS

The meaning of the station symbols is given in the IAGA-News No. 16.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

08	0152	A:	VIC	COI	LMM	DRV	;B:	WNG	WIT	;C:	CZT	(si:	A:	FUR			
													B:	EBR	;C:	NGK)	
12	0100	A:	SOD	WIT	VIC	DOU	FUR	EBR	COI	FRD	KSA	KNY	LMM	KNY	LMM	CZT	
			DRV	;B:	WNG	NGK	MMB	KAK	HAZ								
19	2320	A:	VIC	LMM	;B:	WNG	OTT	COI	;C:	WIT	MMB	EBR	HAZ				
25	1222	A:	LMM	;B:	WNG	FUR	CZT	DRV	;C:	WIT	NGK						

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined.

03 0026 - 0031 HAZ

Very unusual events

none

RADIO PROPAGATION QUALITY INDICES

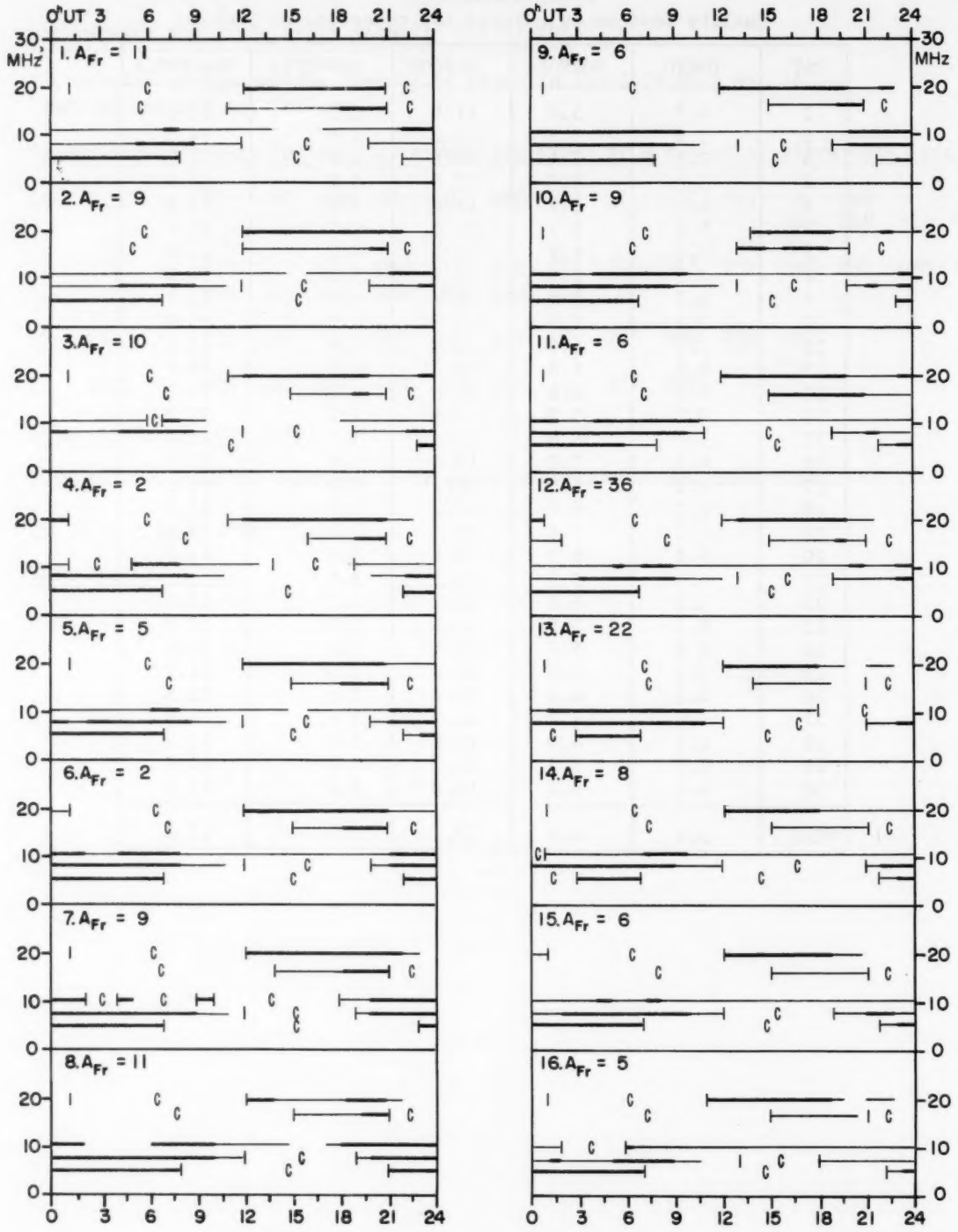
NOVEMBER 1978

Quality Indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKWELL
1	4.7	5.8	11.5	3.2	12.0
2	5.5	5.3	13.2	4.4	14.0
3	7.1	5.4	13.1	4.1	14.1
4	5.8	6.6	12.8	3.8	13.8
5	4.9	6.2	12.9	3.9	13.5
6	5.4	6.9	12.6	4.7	13.6
7	7.3	6.9	13.1	4.7	13.9
8	7.3	6.9	12.9	5.3	14.0
9	5.7	6.5	12.9	4.5	13.8
10	7.8	6.6	13.2	4.8	13.9
11	7.4	6.9	12.4	4.4	13.2
12	6.0	6.8	12.2	4.0	13.9
13	5.6	6.6	12.6	3.3	13.3
14	6.1	5.9	12.4	3.7	13.2
15	4.4	6.4	11.5	3.7	12.7
16	4.1	7.0	12.5	3.1	13.0
17	4.9	6.4	11.7	3.3	13.5
18	4.2	6.7	12.2	3.5	13.5
19	4.3	5.8	12.1	3.8	13.4
20	4.2	6.2	12.8	4.1	13.8
21	4.7	5.7	11.5	3.6	12.7
22	3.3	5.6	11.7	4.1	13.2
23	5.2	5.5	11.6	3.7	13.3
24	5.0	5.7	12.1	3.7	12.8
25	3.3	5.5	11.3	3.0	11.2
26	4.3	4.4	11.2	2.6	12.5
27	4.5	4.7	11.2	2.6	12.8
28	2.7	4.8	11.0	2.7	12.2
29	2.5	5.3	10.9	2.9	11.9
30	4.4	6.4	11.2	3.3	13.1
MEAN	5.1	6.0	12.1	3.7	13.2

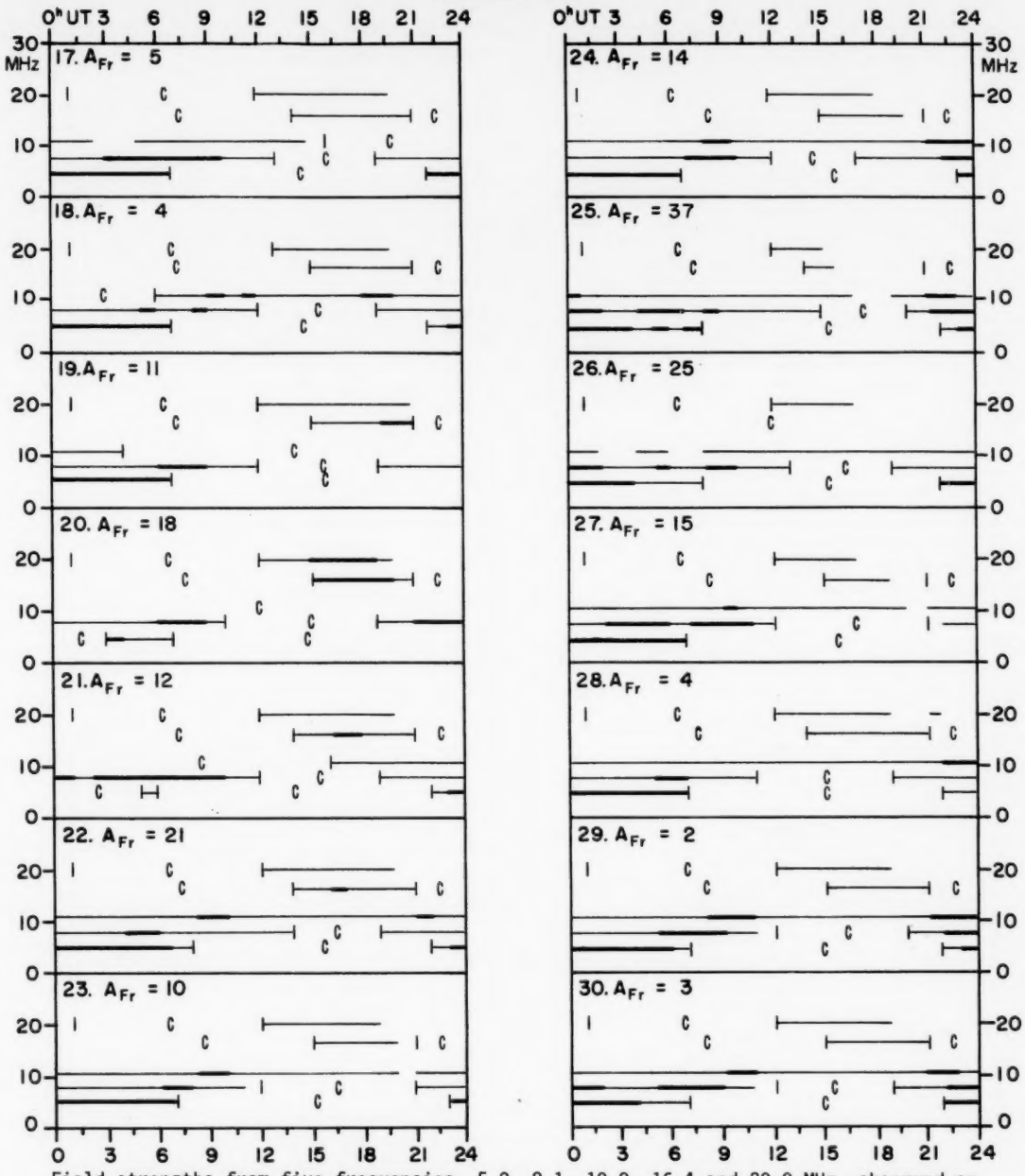
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 1978



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 1978



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow - Norfolk circuit are represented above. Heavy solid lines represent field strengths ≥-12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line.

Adapted from Observations by Deutsche Bundespost

USCOMM-NOAA-ASHEVILLE,N.C.-2/79/950

JANUARY 1979 Number 413 -- Part II

P-A STACKS

Solar-Geophysical Data comprehensive reports

Data for July 1978 -- June 1978 & Miscellanea

Explanation of Data Reports Issued as Number 402 (Supplement) February 1978

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE / BOULDER, COLORADO

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Solar - Geophysical Data

NO. 413 JANUARY 1979

Part II (Comprehensive Reports)

DATA FOR
JULY 1978
JUNE 1978
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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For sale through the National Geophysical and Solar-Terrestrial Data Center, NOAA, Boulder, CO 80303. Subscription Price: $34.00 annually for both part I (Prompt Reports) and part II (Comprehensive Reports) or $18.00 annually for either part. Annual supplement containing explanation is included. For foreign mailing add $32.00 for both parts or $16.00 for either part. Single issue price is $1.50 for either part and $1.40 for the extra issue. Make checks and money orders payable to: Department of Commerce, NOAA/NGSDC.

To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, 412 Part I (or Part II), pages, December 1978, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80303).

SOLAR-GEOPHYSICAL DATA

No. 413

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Chief
Solar-Terrestrial Physics Division

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A.6b	Synoptic Chart and Active Regions (Paris)	407B 4	408B 4	409B 4	410B 70	411B 4	412B 4	413A 4					
A.7f	Helium D3 Chromosphere (Sig Bear)	402A 29	403A 36	404A 29	405A 31	406A 35	407A 34	408A 37	409A 28	410A 37	411A 36	---	413A 38
A.7g	Helium Synoptic Maps (KPNO)	402A 28	403A 35	404A 27	405A 32	406A 36	407A 36	408A 38	409A 29	410A 38	411A 35	412A 30	413A 36
A.7h	Coronal Line Emission (Sac Peak)	403A 46	404A 40	405A 48	406A 54	407A 46	408A 50	409A 38	410A 48	411A 46	412A 40	413A 48	
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9	408A 9	409A 9	410A 11	411A 11	412A 9	413A 11
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9	408A 9	409A 9	410A 11	411A 11	412A 9	413A 11
A.8g	Daily Values of Adjusted Solar Flux (APSL)	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9	408A 9	409A 9	410A 11	411A 11	412A 9	413A 11
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	403A 47	404A 40	405A 48	406A 54	407A 46	408A 50	409A 38	410A 48	411A 46	---	---	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	403A 47	404A 40	405A 48	406A 54	407A 46	408A 50	409A 38	410A 48	411A 46	---	---	
A.10a	169 MHz - Interferometric Observations (Nancay)	402A 16	403A 20	404A 17	405A 17	406A 19	407A 20	408A 19	409A 17	410A 23	411A 20	412A 18	413A 21
A.10c	21 cm East-West Solar Scans (Fleurs)	402A 19	403A 23	404A 20	405A 20	406A 22	407A 23	408A 22	409A 20	410B 58	411A 23	412A 21	413A 24
A.10d	43 cm East-West Solar Scans (Fleurs)	402A 20	403A 24	404A 21	405A 21	406A 23	407A 24	408A 23	409A 21	410B 59	411A 24	412A 22	413A 25
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	402A 18	403A 22	404A 19	405A 19	406A 21	407A 22	408A 21	409A 19	410A 25	411A 22	412A 20	413A 23
A.10f	3 cm East-West Solar Scans (Toyokawa)	402A 17	403A 21	404A 18	405A 18	406A 20	407A 21	408A 20	409A 18	410A 24	411A 21	412A 19	413A 22
A.11k	Solar X-ray Radiation (SOLRAD 11)	403A116	404A108	405A122	406A129	407A123	408A123	410B 92	410A123	411A120	412A118	413A119	
A.11g	Solar X-ray (SMS/GOES)	402A 24	403A 29	404A 24	405A 29	406A 30	407A 29	408A 31	409A 25	410A 32	411A 29	412A 25	413A 30
A.11h	Solar X-ray (OSO-8; 1975-057A)	403A 46	404A 40	405A 48	406A 54	407A 46	408A 50	409A 38	410A 48	411A 46	---	---	
A.11i	Solar X-ray (Columbia U.)											---	
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	402A 30	---	---	---	---	---	---	---	---	---	---	---
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	402A 31	---	---	---	---	---	409A 43	---	---	---	412A 29	---
A.12e	Energetic Solar Particles (IMP H & J)	407B 33	408B 62	410B100	411B 88	413B 83	413B 88	413B 63					
A.12f	Energetic Solar Particles (GMS/SEM)	---	---	---	---	406A 44	---	408A 45	---	---	---	---	---
A.13a	Solar Wind (Pioneers 6 & 7)	402A 30	---	---	---	---	---	---	---	---	---	---	---
A.13ab	Solar Wind (Pioneers 8 & 9)	402A 31	---	---	---	---	---	408A 43	---	---	---	412A 29	---
A.13d	Solar Wind from IPS Measurements	402A 34	403A 37	404A 31	405A 37	406A 41	407A 35	408A 39	409A 33	410A 39	411A 37	412A 35	413A 39
A.13e	Solar Plasma (IMP H & J)	408B 83	408B 61	409B 35	410B 57	411B 53	412B 44	413B 62					
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	---	---	---	---	---	---	---	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 9)	402A 31	---	---	---	---	---	408A 43	---	---	---	412A 29	---
A.17c	Inferred IP Magnetic Field	402A 32	403A 38	404A 32	406A 38	406A 38	407A 38	408A 40	409A 30	410A 40	411A 38	412A 32	413A 40
A.18	Interplanetary Electric Field (Pioneer 8)	---	---	---	---	---	---	---	---	---	---	---	---
A.18	Interplanetary Electric Field (Pioneer 9)	402A 31	---	---	---	---	---	---	---	---	---	412A 29	---
B.	IONOSPHERIC (AND RADIO WAVE PROPAGATION) PHENOMENA												
B.52	Graphs of Transmission Frequency Range	403A148	404A144	405A158	406A171	407A168	409A168	409A142	410A160	411A158	412A162	413A160	
B.53	Quality Figures Based on Frequency Ranges	403A150	404A146	405A157	406A170	407A167	408A170	409A144	410A162	411A160	412A161	413A159	
C.	FLARE-ASSOCIATED EVENTS												
C.1a	Optical Observations Flares	402A 12	403A 12	404A 12	405A 12	406A 12	407A 12	408A 12	409A 12	410A 14	411A 14	412A 12	413A 14
C.1ba	Optical Observations Flares (Standardized Data)	407B 8	408B 8	409B 8	410B 8	411B 9	412B 8	413B 8					
C.1d	Flare Patrol Observations	402A 15	403A 19	404A 16	405A 16	406A 18	407A 19	408A 18	409A 16	410A 22	411A 19	412A 17	413A 20
C.1d	Flare Patrol Observations	407A 24	408B 35	409B 24	410B 29	411B 25	412B 29	413B 35					
C.1e	Flare Indices (by day)	407A 21	408B 34	409B 23	410B 28	411B 24	412B 28	413B 34					
C.1f	Flare Indices (by Region)	408B 77	409B 47	410B 80	411B 66	412B 55	413B 80						
C.3	Solar Radio Waves - Outstanding Occurrences	407B 23	408B 36	409B 25	410B 30	411B 26	412B 30	413B 36					
	Solar Radio Waves - Fixed Frequencies - Selected	402A 21	403A 25	404A 22	405A 22	406A 24	407A 25	408A 24	409A 22	410A 26	411A 25	412A 23	413A 26
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	405B 45	405B 48	406B 62	407B 67	407A151	408A152	409A129	410A147	411A144	412A148	413A147	
C.4a	Solar Radio Spectral Obs. (Port Davis)	403A132	404A122	405A138	406A144	407B 52	408A138	411B 72	411B 75	411A135			
C.4d	Solar Radio Spectral Obs. (Culgoora)	404B 56	405B 40	406B 64	407B 59	407A139	408A138	409A115	410A139	412B 60	412A134	413A134	
C.4e	Solar Radio Spectral Obs. (Weissenau)	403A132	404A122	405A138	406A144	407A139	408A138	409A115	410A139	411A135	412A134	413A134	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	403A132	404A122	405A138	406A144	407B 52	408A138	409A115	410A139	411A135	412A134	413A134	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	403A132	404A122	405A138	---	---	---	---	---	411A135		413A134	
C.4i	Solar Radio Spectral Obs. (Durnten)	403A132	404A122	405A138	406A144	407A139	408A138	409A115	410A139	411A135	412A134	413A134	
C.4j	Solar Radio Spectral Obs. (Manila)	406B 70	404A122	405A138	406A144	407B 52	408A138	409A115	410A139	411A135	412A134	413A134	
C.5e	Solar X-ray (SMS/GOES)	402A 26	403A 29	404A 26	---	406A 32	407A 29	408A 33	409A 27	410A 34	411A 31	412A 27	413A 32
C.5f	Solar X-ray (Columbia U.)											---	
C.6	Sudden Ionospheric Disturbances	403A115	404A105	405A120	406A125	407A119	408A120	409A111	410A121	411A117	412A115	413A117	
D.	GEOMAGNETIC AND MAGNETOSPHERIC PHENOMENA												
D.1a	Geomagnetic Indices Kp, Kn, Ks, Km, Ap, aa, Cp	403A142	404A139	405A151	406A162	407A160	408A160	409A135	410A153	411A151	413B 82	413A152	
D.1ba	27-day Chart of Kp Indices	403A144	404A141	405A153	406A164	407A162	408A162	409A137	410A155	411A153	412A157	413A154	
D.1c	27-day Chart of C9											413A	
D.1d	Principal Magnetic Storms	403A145	404A143	405A156	406A167	407A165	408A165	409A140	410A158	411A156	412A160	413A157	
D.1e	Reduced Magnetograms			405A 39									
D.1f	Sudden Commencement and Solar Flare Effects	403A147	405B 55	406B 72	406A169	407A166	409A167	409A141	410A159	411A157	412A161	413A158	
D.1g	Equatorial Indices Dst	405B 53	405B 54	405A155	406A166	408B 80	408A164	409A139	410A157	411A155	412A159	413A156	
D.1h	Geomagnetic Substorm Log (Boulder)			404A 35	405A 38	406A 42	407A 41	408A 44	409A 34	410A 43	411A 41	412A 36	413A 43
F.	COSMIC RAYS												
F.1a	Cosmic Ray Neutron Counts (Deep River)	403A138	404A138	405A150	407B 70	407A155	408A155	410B 98	410A152	411A150	412A154		
F.1b	Cosmic Ray Neutron Counts (Climax)	406B 73	406B 73	406B 73	406A161	411A 69	411A 69	411A 69					
F.1e	Cosmic Ray Neutron Counts (Alert)	403A138	404A138	405A150	407B 70	407A155	408A155	410B 98	410A152	411A150	412A154		
F.1f	Cosmic Ray Neutron Counts (Calgary)												
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)												
F.1h	Cosmic Ray Neutron Counts (Thule)												
F.1i	Cosmic Ray Neutron Counts (Kiel)	403A138	404A138	405A150	406A161	407A155	408A155	409A134	410A152	411A150	412A154	413A149	
F.1j	Cosmic Ray Neutron Counts (Tokyo)	403A138	404A138	405A150	406A161	407A155	408A155	409A134	410A152	411A150	412A154	413A149	
F.1k	Cosmic Ray Neutron Counts (Kula)												
H.	MISCELLANEOUS												
H.60	IONDS Alert Decisions	402A 5	403A 5	404A 4	405A 4	406A 4	407A 4	408A 5	409A 5	410A 5	411A 4	412A 4	413A 5
H.62	Abbreviated Calendar Record	408B 70	409B 40	410B 72	411A 58	412B 48	413B 72						

Notes:

"410A 48" listed under 1978 Aug means that the sunspot drawings for August 1978 were contained in *Solar-Geophysical Data* Number 410 - Part I, beginning on page 48.

A = Part I, B = Part II.

----- = no data available.
blank = data not yet received.

JULY 1978 DATA

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ACTIVE REGIONS

CARRINGTON ROTATION 1669

(June 3 to June 30, 1978)

Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1668	Activity at West Limb
1	15°N	355°	+1	1	x		disappeared
2	28 S	353	>6	1	x		dispersed
3	18 N	340	>6	1	x		dispersed
4	21 S	340	+2	2			dispersed
5	14 S	336	-2	1	x		decreasing
6	16 N	328	-4	2			stable
7	15 S	320	>6	1	x		dispersed
8	23 N	306	>6	1	x	(11)	decreasing
9	13 N	305	0	1	x		disappeared
10	18 N	300	>6	1	x	(14)	dispersed
11	18 N	281	>6	2		(16)	decreasing
12	17 N	267	-1	2			decreasing
13	17 N	261	>6	1	x		decreasing
14	23 S	255	>6	1	x	(21)	decreasing
15	17 N	244	+1	4			stable
16	13 S	240	+5	2			dispersed
17	23 N	212	>6	1	x	(22)	dispersed
18	17 N	209	>6	3			decreasing
19	23 N	209	+4	1	x		dispersed
20	25 S	200	>6	1	x	(24)	decreasing
21	31 S	197	+6	1	x		dispersed
22	20 N	190	-1	2			dispersed
23	13 N	188	>6	1	x	(26+27)	decreasing
24	26 N	187	+2	2			decreasing
25	21 S	174	>6	1	x		dispersed
26	21 N	172	>6	1	x	(28)	decreasing
27	16 N	166	>6	1	x		dispersed
28	17 N	163	0	4			decreasing
29	20 N	151	>6	3			decreasing
30	12 N	149	>6	1	x		dispersed
31	26 N	143	>6	1	x		dispersed
32	13 N	136	+2	4			decreasing
33	23 S	116	+5	2			decreasing
34	24 S	110	>6	2		(37)	decreasing
35	34 S	109	>6	1	x	(36)	dispersed
36	21 N	98	>6	1	x	(40)	dispersed
37	13 S	97	>6	1	x		decreasing
38	13 N	97	0	2			decreasing
39	24 S	91	-3	1	x		dispersed
40	40 N	88	>6	1	x		disappeared
41	15 S	86	>6	1	x	(42)	decreasing
42	32 N	82	>6	2			dispersed
43	21 N	80	>6	2		(43)	decreasing
44	15 N	76	>6	1	x		dispersed
45	18 S	67	>6	1	x		dispersed
46	17 N	63	>6	5			decreasing
47	16 S	59	-1	2			decreasing
48	25 N	58	>6	3		(47)	decreasing
49	19 S	47	>6	7			decreasing
50	23 N	34	>6	3		(49+50)	decreasing
51	24 N	33	+2	4			decreasing
52	29 N	26	>6	2			decreasing
53	30 S	0	>6	1	x		dispersed

ACTIVE REGIONS

CARRINGTON ROTATION 1670

(June 30 to July 27, 1978)

Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1669	Activity at West Limb
1	34°N	348°	+5	1	x		disappeared
2	17 N	342	>6	2			decreasing
3	29 S	342	-2	1	x		disappeared
4	11 N	336	-3	1	x		decreasing
5	16 N	330	>6	1	x	(1)	decreasing
6	28 N	328	+2	3			decreasing
7	23 S	325	0	2			stable
8	28 S	319	-4	2			stable
9	23 N	318	>6	1	x		dispersed
10	14 S	314	>6	2			stable
11	22 N	304	+4	1	x		decreasing
12	17 N	301	-1	2			decreasing
13	19 S	291	+5	2			decreasing
14	21 N	282	>6	3			decreasing
15	24 S	266	>6	1	x		dispersed
16	21 N	265	-3	3			increasing
17	29 S	258	>6	1	x		dispersed
18	21 S	252	>6	1	x	(14)	decreasing
19	19 N	243	>6	1	x	(15)	dispersed
20	19 S	242	+3	4			decreasing
21	21 N	217	>6	1	x	(17)	dispersed
22	17 N	209	>6	1	x	(18)	dispersed
23	19 S	200	>6	2			decreasing
24	26 N	194	>6	2			decreasing
25	32 S	180	>6	1	x		disappeared
26	27 S	175	+6	1	x		decreasing
27	18 N	168	>6	7			decreasing
28	27 N	162	>6	2			dispersed
29	13 S	150	>6	1	x		disappeared
30	17 N	139	>6	3			decreasing
31	15 N	138	>6	1	x		decreasing
32	12 N	123	+3	2			dispersed
33	24 S	121	+3	2			decreasing
34	38 S	121	-2	2			decreasing
35	19 N	114	0	2			decreasing
36	13 N	108	-3	2			decreasing
37	20 N	107	>6	2			decreasing
38	29 S	104	>6	1	x	(34)	dispersed
39	21 S	98	-5	2			(?)
40	13 N	100	>6	2		(38)	decreasing
41	21 S	98	>6	1	x		decreasing
42	18 S	88	>6	1	x		decreasing
43	15 S	74	+4	1	x		dispersed
44	27 S	71	+5	1	x		disappeared
45	20 N	68	>6	1	x	(46)	decreasing
46	17 S	64	>6	1	x		decreasing
47	28 N	51	>6	1	x	(48)	dispersed
48	25 S	40	>6	1	x	(49)	dispersed
49	23 N	34	>6	1	x	(50)	decreasing
50	20 S	28	>6	1	x		dispersed
51	28 N	26	>6	1	x	(51)	decreasing
52	19 N	25	+3	2			dispersed
53	30 N	13	>6	1	x	(52)	decreasing
54	27 N	11	+4	2			decreasing

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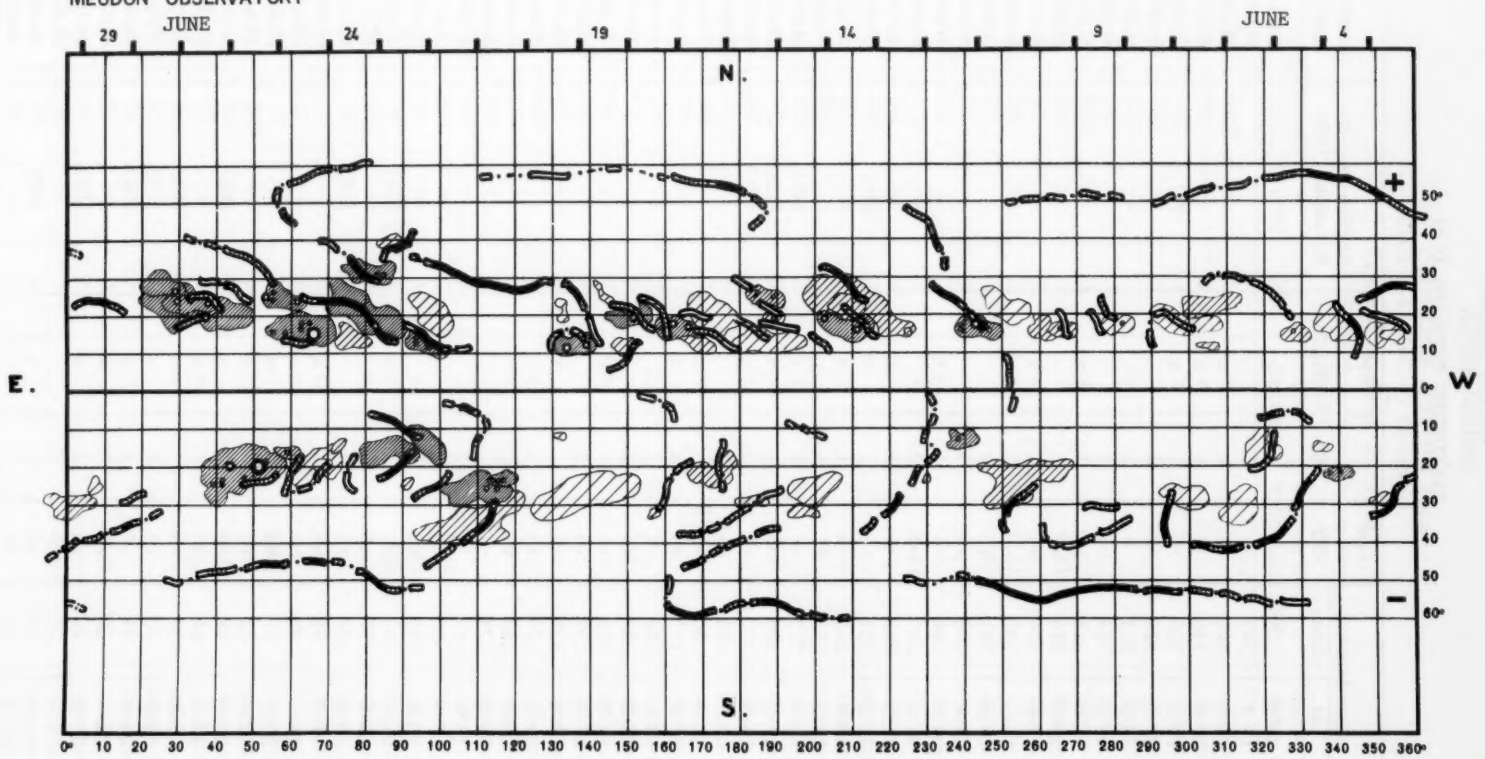
SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1669

JUNE 3 TO JUNE 30, 1978

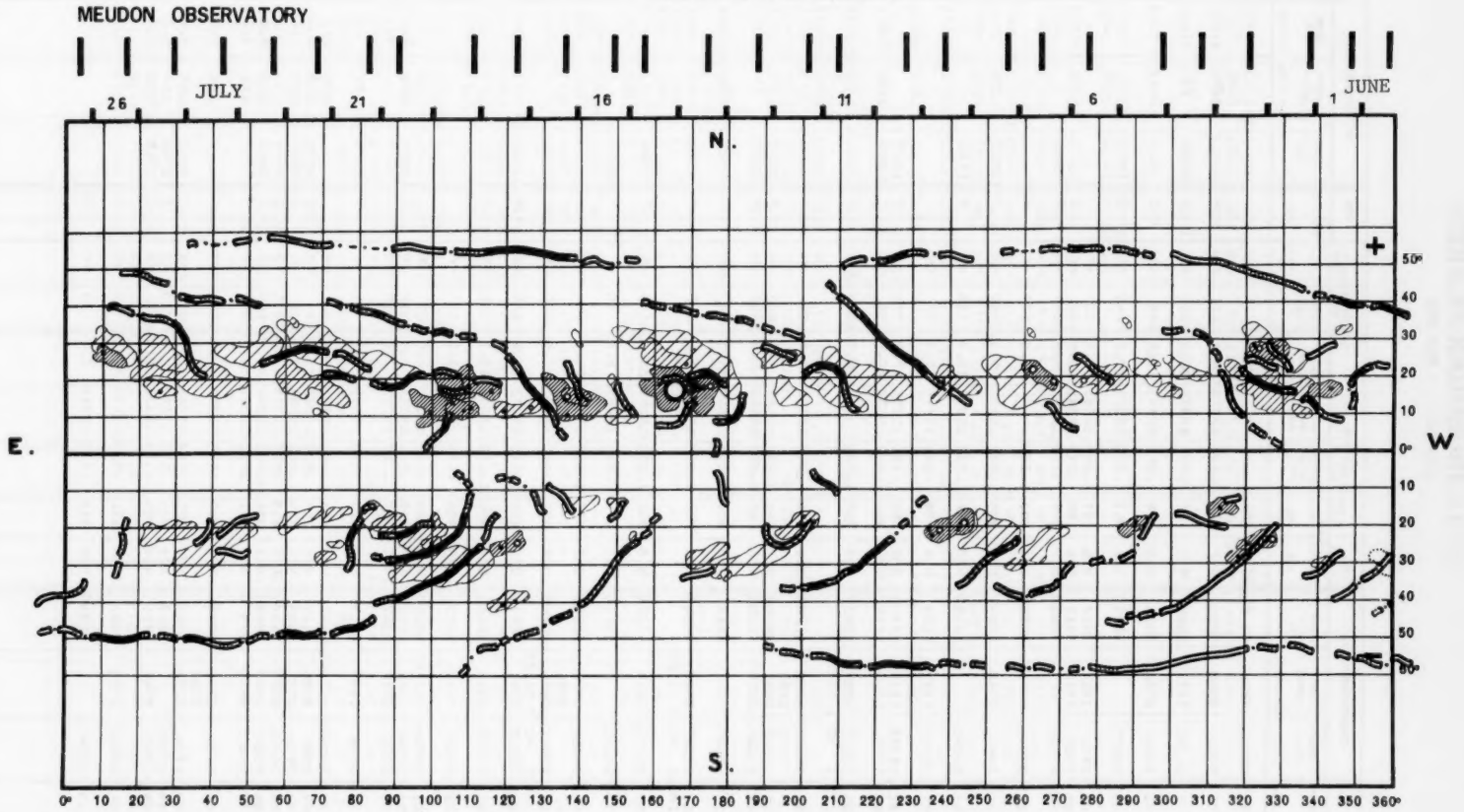
MEUDON OBSERVATORY



SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1670

JUNE 30 - JULY 27, 1978



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Hα SOLAR FLARES

JULY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
	01	0207	0213	NO FLARE PATROL														
934 MANI	01	0304	0306	0316	N25	W40	.700	15376	28.1	12	-N		P		120	1.7		Y5
935 CATA	01	0635E	0635	0645	S19	W65	.924	15375	26.4	10D	-B	1	P	0635	28			Y5
936 MEUD	01	0821	0824	0834	N16	E09	.273	15381	2.0	13	-F		C					Y5
937 KHAR	01	0857E		0921D	S21	W58	.879	15375	27.0	24D	-F		P	0858			D	Y5
GRP67938	01	0900	0902	0922	N16	E07	.256	15381	1.9	22	-F							
MEUD	01	0900	0902	0910	N16	E09	.273	15381	2.1	10	-F		C				E	
KHAR	01	0910E		0934D	N17	E05	.258	15381	1.8	24D	-N		P	0924			D	
939 KHAR	01	0917E		0930D	N28	W90	1.000		24.6	13D	-F		P					Y5
940 CATA	01	0950E	0950	1010	S16	W75	.972	15375	25.8	20D	-N	2	P	0950	39			Y5
941 KHAR	01	1025E		1040D	N25	W46	.760	15376	28.0	15D	-F		P	1033				Y5
GRP67942	01	1033+2	1035 1045	1105	S20	W59	.885	15375	27.0	32	1N						E	
KHAR	01	1033E	1035	1100D	S20	W59	.885	15375	27.0	27D	1N		P	1035			E	
CATA	01	1035	1045	1105	S20	W60	.892	15375	26.9	30	1N	2	C	1045	112	2.5		
943 KHAR	01 IMP+1 NO # RAMY2	1113E	1230	1253D	N28	W90	1.000		24.7	100D	?F		P				T	Y5
GRP67944	01	1123+7	1123 1135	1158D	N21	E66	.918	15385	6.4	35	-N						D	
KHAR	01	1123E	1123	1158D	N21	E68	.930	15385	6.6	35D	-N		P	1127			D	
CATA	01	1130	1135	1155D	N21	E65	.911	15385	6.4	25D	1N	2	P	1135	84			
945 TACH	02	0534		0617	N18	W90	1.000	15368	25.5	43	1B		C	0535	264		Y	Y5
946 KHAR	02 IMP+1 NO # CATA1	0900E	0900	0924D	N28	W90	1.000	15373	25.6	24D	?N		P	0906			T	Y5
947 KHAR	02	0907E	0914	0931D	N18	W90	1.000	15368	25.6	24D	-F		P	0916				Y5
948 KHAR	02	0916E		0925D	N21	E54	.824	15385	6.4	9D	-F		P	0918			D	Y5
GRP67949	02	0931E	0934 0941	1004D	N30	W90	1.000	15373	25.6	33	N							
KHAR	02 IMP+1 NO # CATA1	0931E	0934	1004D	N28	W90	1.000	15373	25.6	33D	?N		P				T	
KHAR	02	0934E	0941	0951D	N33	W90	1.000	15373	25.6	17D	-F		P					
950 KHAR	02	0937E	0941	1001D	S17	W90	1.000	15375	25.7	24D	-F		P					Y5
951 KANZ	03	1003	1003	1015	S29	W24	.636		1.6	12	-F	1					EG	Y5
GRP67952	03	1255+1	1322+2	1510D	N18	W09	.298	15381	2.9	135	-F						GJ	
LVOV	03	1255E	1324	1510D	N17	W09	.284	15381	2.9	135D	-F		C	1324	200	2.1	CJ	
KANZ	03	1256	1322	1347D	N19	W10	.320	15381	2.8	51D	-N	2					G	
953 VORO	04	0008	0009	0013	N28	W13	.466	15388	3.0	5	-B		C	0009	72	.8	DJ	Y5
GRP67954	04	0533+2	0536+4	0607	N27	W18	.491	15388	2.9	34	-N				110	1.3	JU	
CULG	04	0533	0536	0610	N28	W16	.503	15388	2.9	37	-N		C	0536	100	1.2	U	
ABST	04	0534	0537	0604	N27	W18	.491	15388	2.9	30	-N		C	0537	114	1.4	FJ	
MITK	04	0534E	0538	0600D	N27	W19	.499	15388	2.8	26D	-B		C	0538			D	
TACH	04	0535	0540	0546D	N27	W18	.491	15388	2.9	11D	1F		C	0540	220	2.5	E	
MANI	04	0537E	0539	0557D	N26	W17	.470	15388	3.0	20D	-F		V		110	1.2		
GRP67955	04	0724	0732 0740	0800	N27	W19	.499	15388	2.9	36	-N				110	1.3	FJZ	
ABST	04	0724	0732	0802	N27	W20	.506	15388	2.8	38	-N		C	0732	157	1.9	FJZ	
BUCA	04	0730E		0800	N28	W19	.511	15388	2.9	30D	-N		C	0740	107	1.3		
CATA	04	0735	0740	0755	N27	W19	.499	15388	2.9	20	-N	1	C	0740	112	1.3		
956 MEUD	04	0856E	0856	0902	N28	W21	.528	15388	2.8	6D	-F		C				E	Y5
957 MEUD	04	0934		0939D	N28	W19	.511	15388	3.0	5D	-F		C				DK	Y5

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
GRP67958	04	0940	0945+3	1010	N27	W20	.508	15388	2.9	30	-N				120	1.4	D
CATA	04	0940	0945	1010	N27	W20	.508	15388	2.9	30	-B	2	C	0945	140	1.6	
KIEV	04	0941E	0948	1010D	N27	W20	.508	15388	2.9	29D	-F		C	0948	100	1.2	D
959 KHAR	04	1105E		1150D	N26	W22	.516	15388	2.8	45D	-N		P	1112			D Y5
960 LVOV	04	1418	1434	1510	N26	W25	.546	15388	2.7	52	-F		C	1434	150	1.8	D Y5
	04	2016	2032	NO FLARE PATROL													
	04	2041	2102	NO FLARE PATROL													
GRP67961	04	2223+0	2223	2231	S25	W24	.596	15389	3.1	8	-F						DJ
VORO	04	2223		2232	S25	W24	.596	15389	3.1	9	-N		C	2228	81	1.0	DJ
MANI	04	2223E	2223U	2229	S25	W24	.596	15389	3.1	6D	-F		V		15	.2	
GRP67962	04	2225+3	2227+2	2234	N20	E15	.379	15385	6.1	9	-F				70	.8	DH
CULG	04	2225	2227U	2235	N20	E15	.379	15385	6.1	10	-F		C	2227	50	.6	
VORO	04	2228	2229	2232	N20	E15	.379	15385	6.1	4	-N		C	2229	90	1.0	DH
963 MANI	04	2321E	2321U	2332	S25	W23	.587	15389	3.2	11D	-F		V		20	.2	Y5
964 ABST	05	0639E	0641	0651D	N28	W33	.643	15388	2.8	12D	-F		P	0641	79	1.0	D Y5
965 KHAR	05	0825E	0835	0835D	S25	W30	.651	15389	3.1	10D	-F		P				DH Y5
GRP67966	05	1118>9	1140 1150+5	1308	S27	W29	.659	15389	3.3	110	-B				100	1.3	EZ
RAMY	05	1113	1140	1409	S26	W28	.641	15389	3.4	171	-B	4	C		113		Z F
HTPR	05	1139	1155	1250	S25	W29	.641	15389	3.3	71	-N		C	1155	100	1.1	E
KHAR	05	1141E	1206	1310D	S28	W29	.668	15389	3.3	89D	1N		P	1204	150	2.1	E
CATA	05	1145	1150	1155D	S28	W28	.660	15389	3.4	10D	-B	2	P	1150	112	1.5	Z
MCMA	05	1211E		1305	S27	W29	.659	15389	3.3	54D	-B		P	1211	80	1.1	E
GRP67967	05	1307+4	1311+1 1327+2	1339	N27	W36	.666	15388	2.8	32	-N				40	.5	EL
MCMA	05	1307	1328	1345	N27	W37	.677	15388	2.9	38	-B		C	1328	45	.6	EL
KHAR	05	1309E	1311	1327D	N27	W36	.666	15388	2.8	19D	-F		P				E
RAMY	05	1311	1329	1339	N27	W36	.666	15388	2.8	28	-B	4	C		46		
RAMY	05	1311	1312	1339	N27	W36	.666	15388	2.8	28	-N	4	C		26		
HTPR	05	1324	1327	1332	N27	W36	.666	15388	2.9	8	-F		C	1327	30	.4	
GRP67968	05	1507+0	1508+1	1522	N27	W37	.677	15388	2.9	15	-N				50	.7	
HTPR	05	1507	1509	1520	N27	W37	.677	15388	2.9	13	-F		C	1509	30	.4	
RAMY	05	1507	1508	1522	N27	W37	.677	15388	2.9	15	-B	4	C		52		F
MCMA	05	1508E		1530D	N27	W37	.677	15388	2.9	22D	-N		C	1508	80	1.2	E
GRP67969	05	1614+3	1618+2	1624	N27	W37	.677	15388	2.9	10	-N				40	.5	E
MCMA	05	1614	1619	1624	N27	W38	.687	15388	2.8	10	-N		C	1619	70	1.0	E
HTPR	05	1617	1620	1623	N27	W37	.677	15388	2.9	6	-F		C	1620	30	.4	
RAMY	05	1617	1618	1631	N27	W37	.677	15388	2.9	14	-B	4	C		26		
GRP67970	05	1633+2	1637+1	1710	S26	W32	.677	15389	3.3	37	-N				20	.3	
HTPR	05	1633	1638	1641	S25	W32	.669	15389	3.3	8	-F		C	1638	20	.2	
RAMY	05	1635	1637	1710	S26	W31	.668	15389	3.4	35	-B	3	C		20		F
HTPR	05	1653		1706D	S25	W33	.678	15389	3.2	13D	-F		C	1701	30	.3	
MCMA	05	1700E		1708D	S27	W33	.694	15389	3.2	8D	-N		C	1708	40	.6	E
971 MCMA	05	1733E		1800	S21	W02	.412	15386	5.6	27D	-F		C	1736	60	.7	E Y5
GRP67972	05	1748	1803+5 2022	2028	S27	W33	.694	15389	3.3	160	-B				140	1.9	FH
PALE	05	1749	1808	1959	S27	W33	.694	15389	3.3	131	-B	3	C		188		DE F
MCMA	05	1751E	1803	2028D	S27	W33	.694	15389	3.3	158D	-B		C	1803	90	1.4	FH
PALE	05	2021	2022	2028	S27	W33	.694	15389	3.4	7	-N	3	C		51		H F
973 PALE	05	2039	2043	2046	S27	W33	.694	15389	3.4	7	-N	3	C		22		F Y5
974 PALE	05	2058	2102	2107	S27	W33	.694	15389	3.4	9	-N	3	C		51		DE Y5
GRP67975	05	2112+2	2117+6	2131	N26	W40	.702	15388	2.9	19	-N				40	.6	D
MCMA	05	2112	2117	2128	N27	W40	.707	15388	2.9	16	-N		C	2117	25	.4	D
PALE	05	2114	2123	2133	N26	W40	.702	15388	2.9	19	-N	3	C		48		DE

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE JUL	START	MAX PHASE	END	APPROX LAT.	APPROX LONG. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN		CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
GRP67976	06	0735+5	0735+7	0749	S26	W40	.750	15389	3.3	14	-F				50	.8	J	
BUCA	06	0735		0746	S26	W39	.741	15389	3.4	11	-F		C	0740	64	1.0		
CATA	06	0735	0735	0750D	S27	W40	.756	15389	3.3	150	-N	1	P	0735	28	.4	T	
ABST	06	0737E	0740	0749D	S26	W40	.750	15389	3.3	120	-F		P	0740	87	1.4	DJ	
HTPR	06	0740	0742	0748	S26	W40	.750	15389	3.3	8	-F		C	0742	40	.5	E	
GRP67977	06	0932+4	0939+3	0952	S26	W41	.759	15389	3.3	20	-F				60	.9	EJ	
ABST	06	0932	0939	0947	S26	W41	.759	15389	3.3	15	-F		C	0939	87	1.4	DJ	
KHAR	06	0932E	0942	1000D	S27	W43	.782	15389	3.2	280	-F		P				E	
KANZ	06	0933	0941	0952	S25	W41	.753	15389	3.3	19	-B	2						
HTPR	06	0936		0943D	S26	W41	.759	15389	3.3	70	-F		C	0936	40	.5	E	
978 KHAR	06	1010E	1013	1020D	S27	W43	.782	15389	3.2	100	-F		P				E	Y5
GRP67979	06	1030+5	1040+5	1050	S27	W41	.765	15389	3.4	20	-N				70	1.1	J	
KHAR	06	1030E	1040	1046D	S27	W43	.782	15389	3.2	160	-N		P				E	
CATA	06	1035	1045	1050	S28	W41	.770	15389	3.4	15	-N	2	C	1045	56	.9	T	
ABST	06	1041E	1041	1049D	S26	W41	.759	15389	3.4	80	-F		P	1041	87	1.4	DJ	
980 MCMA	06	1131E		1140	S28	W42	.779	15389	3.3	90	-F		C	1131	25	.4	D	Y5
GRP67981	06	1206+8	1209+6 1300	1304D	S27	W42	.773	15389	3.4	58	-N				45	.7	E	
MCMA	06	1206	1209	1235	S28	W42	.779	15389	3.4	29	-N		C	1209	35	.5	E	
RAMY	06	1214	1215	1409	S26	W42	.768	15389	3.4	115	-N	3	C		51			
MCMA	06	1258	1300	1304	S28	W42	.779	15389	3.4	6	-N		C	1300	30	.5	E	
982 RAMY	06	1414	1414	1419	S26	W42	.768	15389	3.4	5	-N	3	C		16			Y5
983 MCMA	06	1439	1442	1455	S21	E38	.701	15400	9.5	16	-F		C	1442	20	.3	D	Y5
GRP67984	06	1502+8	1512+1	1612	S27	W43	.782	15389	3.4	70	-N							
RAMY	06	1502	1512	1612	S26	W43	.776	15389	3.4	70	-N	3	C		152		FDE	
MCMA	06	1510	1513	1514D	S28	W43	.787	15389	3.4	40	-N		C	1513	35	.5	E	
985 MCMA	06	1550	1555	1625	S21	E38	.701	15400	9.5	35	-N		C	1551	30	.4	E	Y5
986 RAMY	06	1639	1640	1644	N09	W62	.882	15387	2.0	5	-N	3	C		16		F	Y5
GRP67987	06	1716>9	1724+7 1740+6	1814	S27	W45	.798	15389	3.3	58	-F				35	.6		
MCMA	06	1716	1724	1735	S28	W43	.787	15389	3.5	19	-F		C	1724	30	.5	E	
RAMY	06	1730	1740	1805D	S27	W46	.807	15389	3.3	35D	-N	3	C		25		F	
RAMY	06	1730	1731	1805D	S27	W46	.807	15389	3.3	35D	-F	3	C		20		F	
MCMA	06	1742	1746	1814	S27	W47	.815	15389	3.2	32	-F		C	1746	35	.6	D	
988 MCMA	06	1753	1754	1815	S21	E36	.680	15400	9.4	22	-F		C	1754	30	.4	E	Y5
989 MCMA	06	1855E	1907	1940	S20	E88	1.000	15397	13.4	45D	-N		C	1907			D	Y5
990 MCMA	06	1934	1935	1938	S21	E35	.670	15400	9.4	4	-N		C	1935	15	.2	D	Y5
991 MCMA	06	2028	2035	2050	S27	W48	.823	15389	3.3	22	-N		C	2035	40	.7	E	Y5
GRP67992	06	2110+1	2115+0	2125	S18	E78	.984	15397	12.7	15	-F							
MCMA	06	2110	2115	2125	S19	E77	.981	15397	12.7	15	-N		C	2115			E	
VORO	06	2111	2115	2125	S18	E80	.989	15397	12.9	14	-F		C	2115	63		D	
993 CULG	06	2258	2302	2321	S22	E31	.637	15400	9.3	23	-F		C	2302	60	.8		Y5
994 CULG	06	2355	2357	0053	S25	W52	.847	15389	3.1	58	-N		C	2357	50	1.0	I	Y5
GRP67995	07	0009	0010 0105+7	0141	S19	E71	.958	15397	12.3	92	-N				40		JK	
VORO	07	0009	0010	0015	S19	E71	.958	15397	12.3	6	-N		C	0010	63		DJ	
CULG	07	0010U	0112U	0150U	S20	E75	.975	15397	12.6	100D	-N		C	0112	40			
VORO	07	0051	0105	0130D	S19	E71	.958	15397	12.4	39D	1F		C	0105	90		JK	
PALE	07	0103E	0109U	0132	S17	E71	.956	15397	12.4	23D	-N	3	C		31		DE	
996 CULG	07	0151	0158	0232	S28	W51	.851	15389	3.3	41	-F		C	0158	20	.4		Y5
997 CULG	07	0400	0409	0455	S27	W53	.862	15389	3.2	55	-N		C	0409	80	1.6		Y5
998 CULG	07	0405	0410	0442	S20	E30	.611	15400	9.4	37	-F		C	0410	40	.5		Y5
999 ABST	07	0530	0533	0540D	N15	E90	1.000	15403	14.0	100	2N		P	0533	201		BFG	Y5

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
GRP68000	07	0650+1	0653+1	0702	S19	E72	.962	15397	12.7	12	-N				70		D
BUCA	07	0650	0654	0705	S20	E70	.954	15397	12.5	15	-N		C	0654	53		
ABST	07	0651	0653	0659	S19	E74	.971	15397	12.8	8	1F		C	0653	87		D
1 HTPR	07	0659	0700	0703	N18	W31	.554	15390	5.0	4	-F		C	0700	10	.1	Y5
GRP68002	07	0709+1	0715+1	0735	N13	E09	.225	15395	8.0	26	-F						G
HTPR	07	0709	0716	0740	N13	E08	.214	15395	7.9	31	-F		C	0716	40	.4	E
ABST	07	0710	0715	0729	N14	E10	.249	15395	8.0	19	-F		C	0715	96	1.1	DG
3 KHAR	07	0845E	0914	0958D	N27	W72	.953		2.0	73D	-F		P	0914			D Y5
4 KHAR	07	0910E	0910	0913D	S24	W59	.896	15389	3.0	3D	-F		P				D Y5
5 KHAR	07	0927E	0927	0930D	S25	W55	.870	15389	3.3	3D	-F		P				D Y5
GRP68006	07	0946+1	0951+7	1010	N15	E90	1.000	15403	14.2	24	-N						AGK
ABST	07	0946	0951	1014	N15	E90	1.000	15403	14.2	28	1N	*	C	0951	122		AFGK
KHAR	07	0947E	0957	1015D	N15	E90	1.000	15403	14.2	28D	1N	*	P	1005			
HTPR	07	0947	0952	1004	N15	E90	1.000	15403	14.2	17	-N	*	C	0952	30		
MONT	07	0954E	0958	1006D	N16	E90	1.000	15403	14.2	12D	-B	*	C	0958	40		D
7 KHAR	07	0947E		1010	S25	W57	.884	15389	3.1	23D	-F		P				E Y5
GRP68008	07	1053+9	1104+1	1127	N18	E90	1.000	15403	14.2	34	1N				80		ADG
KHAR	07	1053E	1105	1200	N18	E90	1.000	15403	14.2	67D	1N		P	1107			
ABST	07	1056	1104	1127D	N18	E90	1.000	15403	14.2	31D	1N		P	1104	96		ADG
HTPR	07	1102	1105	1110	N15	E90	1.000	15403	14.2	8	-N		C	1105		.7	
GRP68009	07	1105+7	1115 1125	1140	S26	W55	.873	15389	3.3	35	-N				70	1.4	F
KHAR	07	1033E		1200	S25	W55	.870	15389	3.3	87D	-F	*	P				T
CATA	07	1105	1125	1140D	S27	W55	.876	15389	3.3	35D	-N	*	P	1125	84	1.8	
TEHR	07	1112	1115	1131	S26	W56	.880	15389	3.3	19	-N	*	C		64		F
10 KHAR	07	1107E	1123	1200	N31	E90	1.000		14.2	53D	?F		P				Y5
	IMP	1 NO	HTPR2	ABST1	CATA1												
11 HTPR	07	1205	1212	1230	S26	W57	.887	15389	3.2	25	-F		C	1212	70	1.2	E Y5
GRP68012	07	1211	1214+1	1227	S19	E65	.925	15397	12.4	16	-B						
HTPR	07	1211	1214	1222	S20	E67	.938	15397	12.5	11	-N		C	1214	60	1.4	E
TEHR	07	1212E	1215	1231D	S18	E64	.918	15397	12.3	19D	1B	2	C		159		F
13 HTPR	07	1234	1238	1246	S20	E67	.938	15397	12.5	12	-F		C	1238	30	.7	Y5
GRP68014	07	1312+1	1314+1	1324	N24	W62	.892	15388	2.9	12	-F				35	.8	E
MCMA	07	1312	1315	1325	N24	W62	.892	15388	2.9	13	-F		C	1315	50	1.2	E
HTPR	07	1313	1314	1323	N24	W63	.899	15388	2.8	10	-F		C	1314	20	.4	E
15 MCMA	07	1424	1426	1432	S16	W49	.798	15384	3.9	8	-F		C	1426	50	.9	E Y5
GRP68016	07	1437+0	1441+2	1533	S26	W57	.887	15389	3.3	56	-B				70	1.5	E
HTPR	07	1437	1441	1530	S26	W58	.894	15389	3.3	53	-B		C	1441	80	1.5	E
MCMA	07	1437	1443	1535	S27	W57	.890	15389	3.3	58	-B		C	1443	60	1.5	E
17 MCMA	07	1526	1535	1546	S16	W49	.798	15384	4.0	20	-N		C	1535	50	.9	E Y5
18 MCMA	07	1552	1604	1635	S27	W57	.890	15389	3.4	43	-F		C	1604	25	.6	DK Y5
GRP68019	07	1618+1	1622+0	1630	S20	E23	.539	15400	9.4	12	-F				25	.3	E
HTPR	07	1618	1622	1628	S20	E24	.549	15400	9.5	10	-F		C	1622	20	.2	
MCMA	07	1619	1622	1632	S21	E23	.549	15400	9.4	13	-N		C	1622	30	.4	E
GRP68020	07	1620>9	1717	1722D	S16	W50	.800	15384	3.9	62	-N						E
MCMA	07	1620		1800	S16	W50	.800	15384	3.9	100	-N		C	1700	60	1.1	E
PALE	07	1710	1717	1722	S16	W51	.810	15384	3.9	12	-N	3	C		25		DE
21 MCMA	07	1622	1626	1640	S22	E66	.935	15397	12.6	18	-N		C	1626	30	.9	E Y5
GRP68022	07	1636+4	1643 1656+3	1710	S27	W59	.903	15389	3.3	34	-N				50	1.1	E
MCMA	07	1636	1643	1710	S27	W58	.896	15389	3.3	34	-N		C	1643	70	1.7	E
HTPR	07	1640	1656	1715	S26	W59	.900	15389	3.3	35	-F		C	1656	50	1.0	E
PALE	07	1647E	1659	1709	S27	W61	.915	15389	3.1	22D	-N	3	C		51		DE
23 MCMA	07	1656	1700	1706	S22	E66	.935	15397	12.7	10	-N		C	1700	15	.5	D Y5

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
GRP68024	07	1728>9	1802+2	1830	S16	W52	.819	15384	3.8	62	-N				60	1.0		
PALE	07	1728	1804U	1804D	S16	W51	.810	15384	3.9	360	-N	*	C		37		DE	
RAMY	07	1748	1802	1830	S17	W54	.840	15384	3.7	42	-N	*	C		80			
25 RAMY	07	1802	1827	1830	S27	W59	.903	15389	3.3	28	-B	3	C		63			Y5
26 MCMA	07	1823		1850	N16	E90	1.000	15403	14.5	27	-N		C					Y5
27 PALE	08	0210	0219	0229	S16	W56	.855	15384	3.9	19	-N	3	C		65		FDE	Y5
28 ABST	08	0748	0758	0807	S21	E15	.480	15400	9.5	19	-F		C	0758	87	1.0	DJ	Y5
GRP68029	08	0752E	0826+1	0835	S13	W61	.889	15384	3.8	43	-F						HJ	
KHAR	08	0752E		0837	S15	W60	.885	15384	3.8	450	-F		P	0815			EH	
ABST	08	0824E	0826	0833	S13	W62	.897	15384	3.7	90	-F		P	0826	87	2.0	DJ	
KHAR	08	0827E	0827	0834	S13	W62	.897	15384	3.7	70	-N		P	0829			D	
GRP68030	08	0752>9	0827+0	0832	N15	E90	1.000	15403	15.1	40	1N				70		ADGJ	
KHAR	08	0752E	0827	0903	N15	E90	1.000	15403	15.1	710	1N	*	P	0825				
HTPR	08	0823	0827	0832	N13	E90	1.000	15403	15.1	9	-N	*	C	0827	50			
ABST	08	0824E	0827	0832	N16	E90	1.000	15403	15.1	80	1N	*	P	0827	87		ADGJ	
GRP68031	08	0838E	0913	0932	S15	W60	.885	15384	3.9	54	-F						DJ	
KHAR	08	0838E		0938	S16	W58	.871	15384	4.0	600	-N		P	0838				
ABST	08	0908E	0913	0925	S15	W62	.900	15384	3.7	170	-F		P	0913	87	2.0	DJ	
32 KHAR	08	0854E		0948	S18	E15	.441	15400	9.5	540	-F		P	0916			E	Y5
GRP68033	08	0954>9	1029	1046	S16	W59	.879	15384	4.0	52	1F						DJ	
KHAR	08	0954E		1047	S17	W57	.865	15384	4.1	530	1N		P	0954			T	
ABST	08	1025	1029	1044	S16	W61	.894	15384	3.9	19	1F		C	1029	105	2.3	DJ	
34 KHAR	08	1122E		1224	S17	W57	.865	15384	4.2	620	?N		P	1132			T	Y5
	IMP.1 NO		HTPR2	MCMA2	CATA1													
35 RAMY	08	1225	1227	1251	S16	W61	.894	15384	3.9	26	-N	3	C		55		F	Y5
GRP68036	08	1251>9	1255 1303	1312	S16	W62	.901	15384	3.9	21	-F							
MCMA	08	1251	1255	1310	S16	W62	.901	15384	3.9	19	-F		C	1255	50	1.2	E	
RAMY	08	1302	1303	1314	S16	W62	.901	15384	3.9	12	-N	3	C		78		F	
37 HTPR	08	1252	1302	1316	S25	W08	.494	15391	7.9	24	-F		C	1302	50	.5	E	Y5
38 RAMY	08	1301	1304	1314	S26	W70	.960	15389	3.3	13	-N	3	C		22		F	Y5
39 RAMY	08	1334	1335	1353	S16	W62	.901	15384	3.9	19	-N	3	C		32		F	Y5
GRP68040	08	1407+1	1414	1420	N15	E83	.991	15403	14.8	13	-N						D	
MCMA	08	1407E		1419	N15	E85	.995	15403	15.0	120	-N		C	1410			D	
KANZ	08	1408	1414	1420	N15	E82	.989	15403	14.7	12	-N	2						
41 RAMY	08	1434	1435	1438	S16	W62	.901	15384	4.0	4	-N	3	C		33		F	Y5
GRP68042	08	1444+0	1445+1	1450	S19	E51	.819	15397	12.4	6	-N				25	.4	D	
MCMA	08	1444E	1446	1451	S19	E49	.801	15397	12.3	70	-N		C	1446	25	.4	D	
RAMY	08	1444	1445	1448	S19	E53	.837	15397	12.6	4	-N	3	C		20			
GRP68043	08	1449+3	1450 1500+4	1514	S25	W72	.967	15389	3.2	25	-F				20		D	
RAMY	08	1449	1450	1454	S26	W71	.964	15389	3.3	5	-N	3	C		14			
HUAN	08	1452	1504	1518	S25	W73	.971	15389	3.1	26	-F	1	C	1504	20		D	
RAMY	08	1458	1500	1509	S26	W71	.964	15389	3.3	11	-N	3	C		21			
44 HUAN	08	1533		1555	S15	W67	.933	15384	3.6	22	-F	1	C					Y5
45 HUAN	08	1543		1559	S20	E09	.426	15400	9.3	16	-F	1	C					Y5
46 HUAN	08	1649		1702	S20	E09	.426	15400	9.4	13	-F	1	C					Y5
47 HUAN	08	1716		1727	S15	W67	.933	15384	3.7	11	-F	1	C					Y5
48 HUAN	08	1742		1757	S20	E09	.426	15400	9.4	15	-F	1	C					Y5
GRP68049	08	1749	1750 1829	1953	S26	W75	.979	15389	3.1	124	-F							
HUAN	08	1749	1750	1953	S26	W74	.976	15389	3.2	124	-F	1	C	1750	40			
HUAN	08	1826	1829	1831	S26	W77	.985	15389	3.0	5	-F	*	C	1829	20		D	

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
50 HUAN	08	1809	1812	1818	S15	W67	.933	15384	3.7	9	-F	1	C	1812	30			Y5
51 HUAN	08	1852		1925	S15	W67	.933	15384	3.8	33	-F	1	C	1904	40			Y5
GRP68052	08	1946	1950+1	2021	N16	E82	.989	15403	15.0	35	?N							
HUAN	08	1946	1950	2017	N15	E85	.995	15403	15.2	31	N	2	C	1950	80		E	
	IMP.S IMP.2																	
PALE	08	1947E	1951U	2024	N18	E79	.980	15403	14.7	37D	2B	3	C		230		FDE	
GRP68053	08	1959+4	2008	2045	S15	W66	.927	15384	3.9	46	-N							
HUAN	08	1959		2046D	S15	W67	.933	15384	3.8	47D	-N	1	P	2020	30			
PALE	08	2003	2008	2044	S16	W65	.922	15384	4.0	41	-B	3	C		41		DE	
54 HUAN	08	2016		2021	S20	E06	.412	15400	9.3	5	-F	1	C					Y5
55 HUAN	08	2109		2118D	S15	W67	.933	15384	3.9	9D	-F	1	P					Y5
56 HUAN	08	2117		2118D	S16	E03	.339	15400	9.1	1D	-F	1	P	2118	20	.2	D	Y5
57 VORO	08	2237	2238	2241	S21	E08	.436	15400	9.5	4	-N		C	2238	45	.5	E	Y5
58 VORO	09	0142	0145	0150	N14	E75	.964	15403	14.7	8	?F		C	0145	116		DJ	Y5
	IMP.1 NO		! PALE1															
59 VORO	09	0153	0155	0158	N20	E75	.964	15403	14.7	5	-F		C	0155	72		D	Y5
GRP68060	09	0527>9	0527	0556	S20	E02	.403	15400	9.4	29	-F						J	
			0553															
ABST	09	0527E	0527	0554	S19	E02	.387	15400	9.4	27D	-F		P	0527	79	.9	DJ	
ABST	09	0550	0553	0558	S22	E03	.436	15400	9.5	8	-F		C	0553	114	1.3	EJ	
GRP68061	09	0703		0715	N14	E71	.944	15403	14.6	12	-N				60		DJ	
MITK	09	0703		0718	N14	E72	.949	15403	14.7	15	-N		C	0707		.4		
ABST	09	0707E	0707	0711	N15	E71	.944	15403	14.6	4D	1F		P	0707	87		DJ	
GRP68062	09	0703+7	0712	0721	S24	W87	1.000	15389	2.8	18	-N						ADG	
MITK	09	0703		0721	S24	W90	1.000	15389	2.5	18	-N	*	C	0716		.2		
ABST	09	0710	0712	0720	S25	W85	.999	15389	2.9	10	1F	*	C	0712	87		ADG	
GRP68063	09	0714+1	0722	0734	N13	E79	.980	15403	15.2	20	-N						DJ	
ABST	09	0714	0722	0732	N14	E78	.976	15403	15.2	18	1F		C	0722	87		DJ	
MITK	09	0715		0735	N13	E80	.983	15403	15.3	20	-N		C	0725		.3		
64 ABST	09	0735E	0739	0757	N19	E78	.976	15403	15.2	22D	?F		P	0739	87		DJ	Y5
	IMP.1 NO		! MITK2	CATA1														
GRP68065	09	0808	0817	0841	N18	E75	.964	15403	15.0	33	1F						DJK	
ABST	09	0808	0817	0841	N19	E77	.972	15403	15.1	33	1F		C	0817	87		DJK	
CATA	09	0830E	0830	0835D	N18	E73	.955	15403	14.8	5D	1N	1	P	0830	112		T	
GRP68066	09	0846	0852	0912D	N18	E72	.950	15403	14.8	26	?F						JZ	
			0855															
	IMP.1 NO		! CATA1															
ABST	09	0846	0852	0912D	N18	E75	.964	15403	15.0	26D	1F		P	0852	87		DJZ	
ABST	09	0849	0855	0912D	N19	E70	.939	15403	14.6	23D	1F		P	0855	87		DJ	
67 ABST	09	0919E	0921	0930D	N19	E78	.976	15403	15.2	11D	?F		P	0921	87		DJ	Y5
	IMP.1 NO		! CATA1															
68 ABST	09	0950E	0951	0954D	S18	W04	.376	15400	9.1	4D	-F		P	0951	87	1.0	D	Y5
GRP68069	09	1007+3	1013+2	1116	N18	E69	.933	15403	14.6	69	1B						EH	
KHAR	09	1007E	1013	1026	N18	E70	.939	15403	14.7	19D	1B		P	1012			EHT	
CATA	09	1010	1015	1030	N14	E68	.926	15403	14.5	20	1B	2	C	1015	112			
CATA	09	1010	1015	1105	N18	E70	.939	15403	14.7	55	1B	2	C	1015	84		T	
KHAR	09	1037E		1126	N21	E70	.940	15403	14.7	49D	-N		P	1037			EHT	
GRP68070	09	1133+8	1145+0	1203	N18	E71	.944	15403	14.8	30	1B				90		KZ	
HCMA	09	1133E	1145	1411D	N18	E72	.950	15403	14.9	158D	1B		C	1145	70	2.1	EKZ	
CATA	09	1140	1145	1155	N18	E70	.939	15403	14.7	15	1B	2	P	1145	112		T	
TEHR	09	1141	1145	1203	N18	E71	.944	15403	14.8	22	-B	2	C		102		FDE	
GRP68071	09	1139+1	1142+3	1210	S21	W02	.419	15400	9.3	31	-N				120	1.3	EHZ	
HCMA	09	1139	1142	1210	S21	W03	.421	15400	9.3	31	-N		C	1142	80	1.2	EH	
CATA	09	1140	1145	1155D	S21	W02	.419	15400	9.3	15D	-N	2	P	1145	168	1.9	Z	

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
GRP68072	09	1212	1214 1245	1633	N19	E70	.939	15403	14.8	261	1B						E
TEHR	09	1212	1245	1302D	N18	E70	.939	15403	14.8	50D	-B	*	V		152		FDE
TEHR	09	1212	1214	1302D	N18	E70	.939	15403	14.8	50D	-B	*	V		102		FDE
RAMY	09	1252E	1300	1634D	N19	E70	.939	15403	14.8	222D	2B	*	C		306		DE
RAMY	09	1252E	1424	1634D	N19	E70	.939	15403	14.8	222D	1B	*	C		115		DE
HUAN	09	1503	1505	1509	N20	E70	.939	15403	14.9	6	-N	*	C	1505	40		T
HUAN	09	1543	1550	1556	N19	E69	.933	15403	14.8	13	-F	*	C	1550	30		
HUAN	09	1559		1632	N19	E70	.939	15403	14.9	33	-N	*	C	1614	50		
73 RAMY	09	1349	1351	1356	S16	W75	.973	15384	4.0	7	-N	3	C		9		Y5
GRP68074	09	1500+8	1510+3	1538	S19	E39	.702	15397	12.5	38	-N				45	.6	
RAMY	09	1500	1510	1545	S19	E39	.702	15397	12.6	45	-B	3	C		54		
HUAN	09	1508	1513	1530	S20	E40	.718	15397	12.6	22	-N	1	C	1513	40	.6	
GRP68075	09	1637	1649	1710	N17	E69	.933	15403	14.9	33	-N				70		E
MCMA	09	1544E		1646D	N18	E70	.939	15403	14.9	62D	1N	*	P	1645	100	2.7	EFT
HUAN	09	1637		1710	N20	E70	.939	15403	14.9	33	-N	*	C	1655	45		E
HUAN	09	1647	1649	1657	N14	E65	.905	15403	14.6	10	-N	*	C	1649	50		E
GRP68076	09	1735+2	1740	1816D	S19	E36	.670	15397	12.4	41	1N				270	3.6	
HUAN	09	1735		1747D	S19	E37	.681	15397	12.5	12D	1N	1	P	1741	180	2.5	E
PALE	09	1737	1740	1816D	S19	E36	.670	15397	12.4	39D	1B	3	C		363		FDE
GRP68077	09	1801+1	1802+0	1804	S21	W04	.423	15400	9.5	3	-F				50	.6	
PALE	09	1801	1802	1805	S20	W06	.414	15400	9.3	4	-N	3	C		45		FDE
HUAN	09	1802	1802	1803	S22	W03	.436	15400	9.5	1	-F	1	C	1802	60	.6	
GRP68078	09	1811+4	1822 1841	2127	N19	E68	.927	15403	14.9	196	2B				230		KLXY
PALE	09	1640E	1841U	2123	N17	E67	.920	15403	14.7	283D	2B	*	C		408		FDE
MCMA	09	1811E	1822	2200D	N20	E70	.939	15403	15.0	229D	2B	*	C	1822	280	30.5	EFKLXY
HUAN	09	1815		1937	N20	E69	.934	15403	14.9	82	1N	*	C	1820	180		E
HUAN	09	2130E		2131D	N19	E68	.927	15403	15.0	1D	-F	*	P	2130	25		D
79 PALE	09	2204	2226	2254	N18	E65	.907	15403	14.8	50	-B	3	C		46		F Y5
80 PALE	09	2301	2415	0017	N18	E64	.900	15403	14.9	76	-B	3	C		65		F Y5
GRP68081	10	0137	0143	0258	N19	E64	.900	15403	14.9	81	1B						
PALE	10	0137	0143	0258	N18	E63	.892	15403	14.8	81	1B	3	C		188		FDE
MANI	10	0150E	0150U	0224D	N20	E65	.908	15403	15.0	34D	1B		P		180	3.6	
GRP68082	10	0219+6	0221+5	0239	N20	W34	.600	15409	7.5	20	-B				150	1.9	F
PALE	10	0219	0221	0242	N20	W35	.612	15409	7.5	23	1B	3	C		157		F
MANI	10	0225	0226	0235	N20	W34	.600	15409	7.6	10	-N		V		150	.2	
83 PALE	10	0312	0314	0414	N18	E62	.885	15403	14.8	62	1B	3	C		218		Z F Y5
	10	0349	0412	NO FLARE PATROL													
84 TACH	10 IMP.1	0426E NO	PALE1	0438D	N19	E61	.878	15403	14.8	12D	?N		C	0426	230	4.7	E Y5
85 TACH	10	0436E	0439	0457D	N20	W39	.660	15409	7.3	21D	-N		C	0439	133	1.8	D Y5
GRP68086	10	0500E	0510+5 0523+1	0543	N18	E64	.900	15403	15.0	43	2N				290	6.8	J
TACH	10	0500E	0501	0506D	N20	E63	.894	15403	14.9	6D	1N		C	0501	159	3.5	D
ABST	10	0502	0523	0541	N14	E60	.866	15403	14.7	39	1B		C	0523	227	4.3	FJ
ABST	10	0506	0511	0534	N19	E69	.933	15403	15.4	28	-N		C	0511	87		DJ
ABST	10	0509	0515	0524	N21	E67	.922	15403	15.2	15	-F		C	0515	79		DJ
TACH	10	0509E	0510	0516D	N20	E65	.908	15403	15.1	7D	1N		C	0510	186	4.4	E
TACH	10	0521E	0524	0530D	N15	E61	.875	15403	14.8	9D	2N		C	0524	354	7.7	E
TACH	10	0533E	0533	0545D	N20	E63	.894	15403	15.0	12D	1N		C	0533	186		E
GRP68087	10	0555>9	0622+3 0635	0734	N18	E61	.877	15403	14.8	99	3B				680	14.5	HIJKUX
ABST	10	0500E	0622	1054D	N17	E63	.892	15403	14.9	354D	3B		P	0622	960		FHIJK
CATA	10	0555E	0635	0710D	N18	E60	.869	15403	14.7	75D	3B	2	P	0635	702	14.6	T
ATHN	10	0603	0625	0712	N17	E59	.860	15403	14.7	69	2B	1		0625	721	13.3	
CULG	10	0606	0624	0638D	N17	E61	.876	15403	14.8	32D	2B		P	0624	500	10.0	ZX
BUCA	10	0618E		0759	N19	E58	.853	15403	14.6	101D	2B		C	0626	537	10.7	U
ISTA	10	0630E		0710	N20	E65	.908	15403	15.1	40D	1N						
KHAR	10	0650E	0650	0730	N20	E64	.901	15403	15.1	40D	1N		P				BE

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS		MEASUREMENTS			REMARKS
	DATE JUL	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
88 CULG	10	0613	0622	0635U	N22	W37	.646	15409	7.5	220	-F		C	0622	30	.4	Y5
89 ABST	10	0615	0617	0636	N26	E61	.886	15403	14.8	21	-F		C	0617	87	1.8	DJ Y5
GRP68090	10	0827E	0855 0921	1015	N18	E59	.861	15403	14.8	108	1F						EH
KHAR	10	0827E	0855	1018	N18	E61	.877	15403	14.9	111D	1F	*	P	0942			EH
MONT	10	0842E	0921	1012	N18	E58	.852	15403	14.7	90D	1N	*	C	0921	220		
91 KHAR	10 IMP.1	0840E NO	0850 MONT2	0905 AEST1	N18 CATA1	E90	1.000	15410	17.1	25D	?F		P	0851			Y5
GRP68092	10	1033>9	1143	1208	N18	E57	.843	15403	14.7	95	-N						E
KHAR	10	1033E		1158	N18	E58	.852	15403	14.8	85D	-F	*	P	1050			ET
RAMY	10	1128	1143	1217	N19	E57	.845	15403	14.8	49	-B	*	C		112		
GRP68093	10	1241	1245+7 1318+5	1415	N18	E57	.843	15403	14.8	94	1B				140	2.6	
ZURI	10	1241E	1321	1321D	N18	E57	.843	15403	14.8	40D	1B		P	1321	240	4.7	
RAMY	10	1241	1252	1434	N19	E56	.836	15403	14.7	113	-B	4	C		78		F
RAMY	10	1241	1344	1434	N19	E56	.836	15403	14.7	113	1B	4	C		226		F
KHAR	10	1242E	1245	1252D	N21	E60	.872	15403	15.0	10D	-N		P				D
KANZ	10	1305E	1323	1329D	N17	E56	.833	15403	14.7	21D	1B	2					
HUAN	10	1309	1318	1400	N17	E55	.824	15403	14.7	51	-N	2	C	1318	140	2.6	E
MCMA	10	1312		1415	N20	E60	.871	15403	15.1	63	1B		C	1320	100	2.2	E
94 MCMA	10	1436	1438	1441D	N14	E88	.999	15410	17.2	5D	-F		C	1438			D Y5
GRP68095	10	1452+1	1458+5	1515	N19	E56	.836	15403	14.8	23	-N				20	.4	D
RAMY	10	1452	1503	1538	N19	E55	.827	15403	14.7	46	-B	4	C		23		F
HUAN	10	1452	1458	1505	N19	E57	.845	15403	14.9	13	-F	1	C	1458	20	.3	D
MCMA	10	1453		1515	N18	E56	.834	15403	14.8	22	-N		C	1500	25	.5	D
GRP68096	10	1546+4	1550+2 1557+1	1615	N16	E55	.823	15403	14.8	29	-N				45	.8	K
MCMA	10	1546	1558	1615	N15	E56	.831	15403	14.9	29	1N		C	1558	125	2.2	EK
HUAN	10	1549	1550	1558	N19	E56	.836	15403	14.9	9	-F	1	C	1550	20	.3	D
RAMY	10	1550	1552	1647	N19	E55	.827	15403	14.8	57	-N	3	C		45		FDE
HUAN	10	1553	1557	1603	N13	E55	.820	15403	14.8	10	-F	1	C	1557	40	.7	
GRP68097	10	1655+9	1707 1732+3	1806D	N17	E54	.814	15403	14.8	71	2B				340	5.9	HKUVZ
RAMY	10	1655	1734	1737D	N19	E54	.817	15403	14.8	42D	2B	3	C		438		FDE
RAMY	10	1655	1707	1908D	N19	E54	.817	15403	14.8	133D	-B	3	C		69		FDE
MCMA	10	1700	1735	1907D	N16	E55	.823	15403	14.8	127D	1B		C	1735	225	4.0	FHKVZ
HUAN	10	1704	1732	1808D	N17	E54	.814	15403	14.8	64D	1N	2	P	1732	225	3.8	E
PALE	10	1729E	1734	1806	N18	E55	.825	15403	14.9	37D	2B	3	C		445		UDE
98 RAMY	10	1702	1726	1810	S19	E25	.553	15397	12.6	68	-B	3	C		23		Y5
GRP68099	10	1819	1825 1920	2118	N17	E54	.814	15403	14.8	179	1B						EHU
PALE	10	1813	1920	2123	N17	E54	.814	15403	14.8	184	1B	*	C		338		UDE
PALE	10	1819	1825	2123	N17	E54	.814	15403	14.8	184	1N	*	C		164		UDE
MCMA	10	1913E		2025D	N16	E55	.823	15403	14.9	72D	1B	*	C	1918	150	2.7	F
HUAN	10	1917E		1930D	N17	E54	.814	15403	14.9	13D	1N	*	P	1920	125	2.1	E
MCMA	10	2028	2040	2105D	N17	E52	.795	15403	14.8	37D	1B	*	C	2040	125	2.1	F
VORO	10	2100E		2113	N19	E52	.798	15403	14.8	13D	1N	*	C	2100	143	2.4	H
GRP68100	10	2125>9	2136+1 2154	2205	N17	E53	.805	15403	14.9	40	-N				110	1.9	FHK
PALE	10	2125	2136	2222	N17	E53	.805	15403	14.9	57	-N	3	C		123		F
VORO	10	2133	2137	2157	N19	E52	.798	15403	14.8	24	1N		C	2137	143	2.4	HK
CULG	10	2136	2137	2205	N17	E53	.805	15403	14.9	29	-N		C	2137	80	1.4	
VORO	10	2153	2154	2156	N13	E55	.820	15403	15.0	3	-N		C	2154	63	1.1	D
101 VORO	10	2232	2233	2237	N18	E50	.776	15403	14.7	5	-N		C	2233	81	1.3	D Y5
GRP68102	10	2241+7	2248+3 2303	2309	N17	E52	.795	15403	14.8	28	-N				120	2.0	HK
CULG	10	2241	2251	2345	N16	E52	.793	15403	14.8	64	1N		C	2251	130	2.1	FK
PALE	10	2246	2248	2252D	N17	E52	.795	15403	14.8	6D	1B	3	C		175		FDE
VORO	10	2247	2248	2258	N18	E50	.776	15403	14.7	11	-N		C	2248	90	1.5	E
MANI	10	2248	2250	2255	N17	E48	.753	15403	14.6	7	-N		V		100	1.5	F
VORO	10	2258	2259	2303	N21	E56	.839	15403	15.2	5	-N		C	2259	63	1.1	D
VORO	10	2301	2303	2309	N13	E55	.820	15403	15.1	8	-F		C	2303	72	1.2	DH

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
					APPROX		CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY									
	DATE	START	MAX. PHASE	END	LAT.	MER. DIST.						CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL									MIN								
GRP68103	10	2358+0	2359+3	0016	S20	E20	.513	15397	12.5	18	-F						E	
CULG	10	2358	2402	0015	S20	E20	.513	15397	12.5	17	-F		C	2402	20	.2		
VORO	10	2358	2359	0017	S20	E21	.523	15397	12.6	19	-F		C	2359	63	.7	E	
GRP68104	11	0052+3	0055+4	0117	N17	E49	.763	15403	14.7	25	-N				120	1.9	HJ	
VORO	11	0052	0058	0117	N18	E49	.765	15403	14.7	25	1B		C	0058	179	2.7	HJ	
MANI	11	0054	0055	0105	N17	E47	.742	15403	14.6	11	-N		V		120	1.8		
CULG	11	0055	0059	0120	N15	E50	.771	15403	14.8	25	-N		C	0059	80	1.3	T	
GRP68105	11	0122+0	0124+6	0134	N15	E47	.738	15403	14.6	12	-N						J	
VORO	11	0122	0124	0129	N16	E47	.740	15403	14.6	7	-B		C	0124	134	1.9	DJ	
CULG	11	0122	0130	0138	N14	E48	.748	15403	14.7	16	-N		C	0130	50	.8	FT	
106 VORO	11	0142	0143	0150	N21	E55	.829	15403	15.2	8	-N		C	0143	54	.9	D	Y5
107 CULG	11	0225	0232U	0236D	N11	E51	.777	15403	14.9	110	-F		P	0232	40	.6	FT	Y5
	11	0300	0304	NO FLARE PATROL														
GRP68108	11	0304E	0337+3	0345	N15	E49	.760	15403	14.8	41	1N				140	2.2	F	
PALE	11	0304E	0340U	0352D	N17	E49	.763	15403	14.8	48D	-B	3	C		110		F	
CULG	11	0315E	0315E	0330	N15	E50	.771	15403	14.9	15D	-F		P	0315	40	.6	FBT	
TACH	11	0337E	0337	0345D	N15	E46	.727	15403	14.6	8D	1N		V	0337	176	2.5	E	
	11	0306	0315	NO FLARE PATROL														
GRP68109	11	0353+0	0400+2	0418D	N17	E51	.784	15403	15.0	25	2B				400	6.5	FJU	
TACH	11	0353E	0402	0415D	N15	E51	.781	15403	15.0	22D	2B		C	0402	396	6.5	EFJ	
PALE	11	0353	0400U	0418D	N17	E49	.763	15403	14.8	25D	2B	3	C		505		U F	
MANI	11	0359E	0402	0406D	N18	E55	.825	15403	15.3	7D	1N		V		170	2.9	FE	
110 TACH	11	0426E		0447D	N12	E81	.986	15410	17.3	21D	1N		C	0432	176		EY	Y5
GRP68111	11	0540E	0545	0620D	N16	E48	.751	15403	14.8	40	2B						E	
TACH	11	0540E	0545	0612D	N15	E51	.781	15403	15.1	32D	2B		C	0447	352	5.8	ETB	
CATA	11	0610E	0610	0620D	N17	E46	.731	15403	14.7	10D	1B	2	P	0610	224	3.3	T	
112 CULG	11	0607	0611U	0612D	N21	W50	.782	15409	7.5	5D	-N		P	0611	60	1.0		Y5
GRP68113	11	0702	0711	0725	N18	E45	.722	15403	14.7	23	-F				70	1.0	E	
MONT	11	0702	0711	0721	N18	E46	.733	15403	14.7	19	-F		C	0711	60		E	
BUCA	11	0705E		0728	N18	E45	.722	15403	14.7	23D	-N		C	0705	85	1.3		
GRP68114	11	0815E	0815	0825	N16	E47	.740	15403	14.9	10	-F							
KHAR	11	0815E	0815	0825	N14	E47	.736	15403	14.9	10D	-F		P				D	
KHAR	11	0819E	0819	0825	N19	E48	.757	15403	14.9	6D	-F		P				D	
115 ABST	11	0824	0833	0854	S19	E17	.475	15397	12.6	30	-F		C	0833	87	1.0	DJ	Y5
116 KHAR	11	0829E		0829D	N16	E47	.740	15403	14.9		-F		P				D	Y5
GRP68117	11	0836+0	0838+1	0841	N17	E45	.719	15403	14.7	5	-F				70	1.0	DJ	
MONT	11	0836	0838	0841	N18	E46	.733	15403	14.8	5	-F		C	0838	50		E	
ABST	11	0836	0838	0842	N17	E45	.719	15403	14.7	6	-N		C	0838	96	1.4	DJ	
ZURI	11	0838E	0839	0840	N17	E45	.719	15403	14.7	2D	-F		P	0839	70	1.1		
KHAR	11	0840E		0840D	N17	E44	.708	15403	14.7		-F		P				D	
GRP68118	11	0856+1	0902+1	0919	N13	E48	.746	15403	15.0	23	-N				90	1.4	DJ	
ABST	11	0856	0902	0927	N14	E48	.748	15403	15.0	31	-N		C	0902	96	1.5	DJ	
HTPR	11	0857	0903	0910	N13	E48	.746	15403	15.0	13	-N		C	0903	80	1.2		
GRP68119	11	0933+3	0936+1 0943+1	1000	N18	E45	.722	15403	14.8	27	-N				70	1.0	EJK	
ABST	11	0933	0936	1042D	N19	E45	.725	15403	14.8	69D	1N		P	0936	218	3.2	FJK	
MONT	11	0935	0937	0956	N18	E45	.722	15403	14.8	21	-F		C	0937	50		E	
HTPR	11	0936	0937	1000	N18	E45	.722	15403	14.8	24	-N		C	0937	70	1.0	E	
KANZ	11	0940E		1041	N19	E45	.725	15403	14.8	61D	-N	*						
TEHR	11	0942E	0944U	0953	N20	E46	.738	15403	14.9	11D	-B	2	C		127			
HERS	11	0943E	0943	1002	N18	E45	.722	15403	14.8	19D	1N		P	0949	187	2.7	E	
GRP68120	11	1010>9	1015 1029+6	1048	N35	W85	.994	15407	5.0	38	1F				110		DG	
KHAR	11	1010E	1042	1048D	N36	W88	.998	15407	4.8	38D	-F		P	1042				
MONT	11	1015	1031	1046	N35	W85	.994	15407	5.1	31	-N		C	1031	110		G	
KHAR	11	1015E	1015	1048D	N34	W84	.992	15407	5.1	33D	-F		P	1012			D	
KANZ	11	1018	1035	1048	N36	W81	.986	15407	5.4	30	-F	2					G	
ABST	11	1022	1029	1042D	N34	W88	.998	15407	4.8	20D	1N		P	1029	114		DG	

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX LON. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
121 ABST	11	1027	1034	1042D	N19	W54	.817	15409	7.4	15D	-F		P	1034	87	1.5	DJ Y5
GRP68122	11	1031+1	1056+2 1104+2	1301	N18	E45	.722	15403	14.8	150	2B				680	9.9	EHIKLM
KHAR	11	1002E	1105	1318D	N19	E45	.725	15403	14.8	196D	2B	*	P	1105	500	7.5	EHV
MONT	11	1031	1057	1145D	N18	E45	.722	15403	14.8	74D	2B	*	C	1057	660		H
HTPR	11	1032	1034	1035	N18	E45	.722	15403	14.8	3	-F	*	C	1034	40	.6	E
TEHR	11	1037E	1040U	1046	N20	E46	.738	15403	14.9	9D	-B	*	C		127		
MCMA	11	1037E	1056	1415	N18	E47	.744	15403	15.0	218D	2B	*	C	105E	700	10.9	HILRUX
ZURI	11	1044E	1106	1219D	N18	E46	.733	15403	14.9	95D	3B	*	P	110E	860	13.0	
KANZ	11	1044	1057	1119D	N19	E46	.736	15403	14.9	35D	2B	*					UJ
CATA	11	1045	1056	1105D	N18	E46	.733	15403	14.9	20D	2B	*	P	105E	674	10.2	
HTPR	11	1045		1223D	N18	E48	.755	15403	15.0	98D	2B	*	C	1100	850	11.9	EFIKMT
WEND	11	1049	1057	1128D	N18	E43	.699	15403	14.7	39D	2N	*	P		800	11.5	
TEHR	11	1054E	1058U	1150	N20	E46	.738	15403	14.9	56D	1B	*	C		382		
HERS	11	1104E	1104	1253D	N18	E45	.722	15403	14.8	109D	1B	*	P	110E	230	3.3	E
RAMY	11	1154E	1157U	1411	N19	E44	.713	15403	14.8	137D	1B	*	C		205		FOE
GRP68123	11	1033+1	0956 1035+1	1055	S20	W28	.594	15400	9.3	22	-F						EJ
ABST	11	0951	0956	1042D	S20	W29	.604	15400	9.2	51D	-F	*	P	0956	79	1.0	DJ
ABST	11	1033	1036	1042D	S20	W28	.594	15400	9.3	9D	-F	*	P	1036	131	1.7	FJ
HTPR	11	1034	1035	1050	S21	W28	.603	15400	9.3	16	-F	*	C	1035	20	.2	E
KHAR	11	1039E	1042	1059D	S19	W29	.596	15400	9.3	20D	-F	*	P				E
GRP68124	11	1232E	1232	1338D	N15	E42	.679	15403	14.7	66	1N						EI
LVOV	11	1232E	1232	1314D	N15	E45	.715	15403	14.9	42D	1N	*	C	1232	200	3.1	BI
HUAN	11	1244E		1338D	N16	E40	.658	15403	14.5	54D	-N	*	P	1247	80	1.1	E
125 KANZ	11	1059		1106D	N19	W55	.826	15409	7.3	7D	-F	2					Y5
GRP68126	11	1134+1	1136+3	1146	S30	E33	.723	15401	14.0	12	-F				100	1.4	EG
ZURI	11	1134	1136	1142	S30	E33	.723	15401	14.0	8	-N		C	1136	130	2.0	
MCMA	11	1135	1139	1147	S30	E33	.723	15401	14.0	12	-N		C	1139	60	.9	E
HTPR	11	1135	1137	1146	S30	E28	.685	15401	13.6	11	-F		C	1137	100	1.2	EG
KHAR	11	1136E	1136	1146D	S29	E33	.715	15401	14.0	10D	-F		P				
127 RAMY	11	1215	1301	1314D	N19	W55	.826	15409	7.4	59D	-B	2	C		67		Y5
GRP68128	11	1219	1254	1317	S19	W29	.596	15400	9.3	58	-F				25	.3	D
RAMY	11	1219	1254	1314D	S19	W28	.585	15400	9.4	55D	-N	2	C		25		
HUAN	11	1244E		1317	S20	W31	.625	15400	9.2	33D	-F	1	P	1300	20	.2	D
129 MCMA	11	1328	1336	1344	N15	E70	.938	15410	16.8	16	-F		C	1336	15	.5	D Y5
GRP68130	11	1351+1		1400D	N17	E43	.696	15403	14.8	9	-N				60	.8	E
HTPR	11	1351		1357D	N18	E43	.699	15403	14.8	6D	-N	*	C	1353	40	.6	E
HUAN	11	1352		1400D	N17	E43	.696	15403	14.8	8D	-N	*	P	1353	85	1.1	E
GRP68131	11	1410+9	1415+4 1425+0	1434	S22	W27	.602	15400	9.6	24	-N				60	.7	EK
HTPR	11	1410	1418	1428	S22	W26	.592	15400	9.6	18	-N		C	1418	50	.6	EK
LVOV	11	1415	1415	1420D	S25	W20	.571	15400	10.1	5D	-F		P	1415	150	1.9	
MCMA	11	1415	1419	1445	S23	W26	.602	15400	9.6	30	-N		C	1419	40	.5	E
HUAN	11	1416E		1418D	S23	W27	.611	15400	9.6	2D	-N	1	P	1417	50	.6	E
UPIC	11	1419E	1425U	1432	S22	W27	.602	15400	9.6	13D	-F		P	1425	102	64.0	
RAMY	11	1419	1419	1439	S19	W28	.585	15400	9.5	20	-N	3	C		69		FOE
TEHR	11	1425E	1425U	1431	S19	W28	.585	15400	9.5	6D	-N	2	C		64		
GRP68132	11	1424+1	1428+3	1448	N19	W56	.835	15409	7.4	24	-N						F
RAMY	11	1424	1431	1454	N19	W55	.826	15409	7.5	30	-N	*	C		31		
UPIC	11	1425	1428U	1441	N19	W57	.844	15409	7.3	16	1F	*	P	1428	143	132.0	F
GRP68133	11	1425+2	1427+4	1439	S19	E13	.442	15397	12.6	14	-N				40	.4	E
UPIC	11	1425	1428	1445	S18	E13	.429	15397	12.6	20	-N		P	1428	163	90.0	
RAMY	11	1427	1427	1430	S19	E13	.442	15397	12.6	3	-B	3	C		27		
MCMA	11	1427	1431	1439	S20	E14	.463	15397	12.7	12	-F		C	1431	40	.5	E
GRP68134	11	1452+8	1506 1533	1609	N18	E41	.676	15403	14.7	77	-N						EK
HUAN	11	1452		1606	N17	E41	.673	15403	14.7	74	-N	1	C	1550	85	1.1	E
HTPR	11	1453		1516D	N17	E41	.673	15403	14.7	23D	-F		C	1458	50	.7	E
MCMA	11	1455E		1612D	N18	E45	.722	15403	15.0	77D	-B		C	1458	60	.9	EK
UPIC	11	1500	1506	1520	N19	E40	.667	15403	14.6	20	1N		P	1506	224	151.0	T
HTPR	11	1525E		1610	N17	E41	.673	15403	14.7	45D	-F		C	1537	50	.7	E
RAMY	11	1529	1533	1627	N19	E42	.691	15403	14.8	58	-N	3	C		28		FOE
UPIC	11	1537	1551	1556	N18	E39	.652	15403	14.6	19	1N		P	1551	204	135.0	T

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS
					APPROX		CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY			CONC	TYPE	TIME UT	MEAS. AREA	CORR AREA	
	DATE JUL	START	MAX. PHASE	END	LAT.	MER. DIST.				MIN.					Mill. of Disk	Sq. Deg	
GRP68135	11	1613+2	1613+6	1627	N16	E39	.645	15403	14.6	14	-N				70	.9	H
RAMY	11	1529	1613	1627	N19	E42	.691	15403	14.8	58	-N	3	C		66		FDE
HUAN	11	1613	1619	1623D	N14	E37	.614	15403	14.5	10D	-N	1	P	1619	40	.5	
MCMA	11	1613	1619	1644D	N17	E40	.661	15403	14.7	31D	-B		C	1619	90	1.2	EW
UPIC	11	1615	1616	1626	N16	E38	.633	15403	14.5	11	-N		P	1616	82	52.0	T
GRP68136	11	1642+6	1650+3	1706	N18	E41	.676	15403	14.8	24	-N				120	1.6	
RAMY	11	1642	1650	1706	N18	E41	.676	15403	14.8	24	-N	*	C		141		FDE
UPIC	11	1645	1653	1700D	N18	E39	.652	15403	14.6	15D	1N	*	P	1653	184	122.0	
PALE	11	1646E	1650U	1651D	N17	E42	.685	15403	14.8	5D	-B	*	C		75		F
MCMA	11	1647E		1736D	N18	E42	.687	15403	14.8	49D	-B	*	C	1653	125	1.7	E
HTPR	11	1648	1653	1706	N17	E40	.661	15403	14.7	18	-N	*	C	1653	80	1.0	E
137 RAMY	11	1645	1649	1659	N19	W56	.835	15409	7.5	14	-N	3	C		24		F Y5
GRP68138	11	1713+0	1715+0	1724	N17	E40	.661	15403	14.7	11	-N				35	.5	
RAMY	11	1713	1715	1724	N18	E41	.676	15403	14.8	11	-B	*	C		34		F
HTPR	11	1713	1715	1723	N17	E40	.661	15403	14.7	10	-F	*	C	1715	40	.5	E
139 HUAN	11	1826	1827	1828	N15	E40	.655	15403	14.8	2	-F	1	C	1827	20	.2	D Y5
GRP68140	11	1907+0	2007 2025+1	2106	N17	E41	.673	15403	14.9	119	1B				160	2.2	U
PALE	11	1907	2026U	2106	N17	E41	.673	15403	14.9	119	1B	3	C		212		U F
HUAN	11	1907E		1916	N13	E42	.675	15403	14.9	9D	-N	1	P	1910	30	.4	
MCMA	11	2006	2007	2010	N16	E42	.682	15403	15.0	4	-F		C	2007	35	.5	E
MCMA	11	2017	2025	2111D	N18	E38	.640	15403	14.7	54D	-B		C	2025	110	1.5	E
GRP68141	11	2159	2231+1	2320	N18	E38	.640	15403	14.8	81	2B						FUY
PALE	11	2159	2232	2325	N20	E38	.647	15403	14.8	86	2B	3	C		878		U F
CULG	11	2230E	2231	2320	N17	E37	.623	15403	14.7	50D	1B		P	2231	220	3.1	UY
MANI	11	2242E	2242U	2255	N18	E38	.640	15403	14.8	13D	2F		V		400	5.4	
GRP68142	11	2219+7	2221 2235	2237	N20	W60	.871	15409	7.4	18	-F						
CULG	11	2219	2221U	2237	N21	W60	.872	15409	7.4	18	-F		P	2221	30	.6	
PALE	11	2226	2235	2236	N20	W60	.871	15409	7.4	10	-N	3	C		60		FDE
GRP68143	12	0012	0017 0048+1	0104D	N16	E36	.607	15403	14.7	52	-N						J
CULG	12	0012	0017U	0040	N16	E37	.619	15403	14.8	28	-F	*	C	0017	50	.7	FJ
PALE	12	0030E	0048U	0144	N18	E36	.614	15403	14.7	74D	-B	*	C		148		FDE
CULG	12	0046	0049	0104	N12	E36	.595	15403	14.7	18	-N	*	C	0049	50	.6	
144 CULG	12	0019	0020	0025	N35	W90	.999	15407	5.3	6	-N		C	0020	10		Y5
145 CULG	12	0110	0112	0132	N15	E36	.603	15403	14.7	22	-N	*	C	0112	20	.3	F Y5
146 CULG	12	0230	0235	0240	N13	E62	.882	15410	16.8	10	-F		C	0235	30	.6	Y5
GRP68147	12	0236+2	0255+4	0340	N18	E35	.602	15403	14.7	64	1B				210	2.6	U
CULG	12	0236	0259	0305D	N16	E35	.594	15403	14.7	29D	1N		P	0259	170	2.1	
PALE	12	0238	0259	0340	N18	E35	.602	15403	14.7	62	2B	3	C		510		U F
MANI	12	0249E	0251U	0251D	N18	E36	.614	15403	14.8	2D	1N		V		200	2.6	
TEHR	12	0253E	0255U	0300D	N18	E36	.614	15403	14.8	7D	1B	2	V		222		DE
148 CULG	12	0438E	0440	0450	S32	E22	.664	15401	13.8	12D	-F		C	0440	10	.1	Y5
149 CULG	12	0446	0447	0509	N19	W68	.927	15409	7.1	23	-N		C	0447	20	.5	J Y5
GRP68150	12	0515+6	0531+2	0544	N17	E33	.572	15403	14.7	29	-N						
HITK	12	0515E		0534D	N17	E33	.572	15403	14.7	19D	1N	*	P	0534	240	3.1	
CULG	12	0521	0531	0543	N15	E33	.563	15403	14.7	22	-N	*	C	0531	40	.5	F
TEHR	12	0529E	0533U	0545	N18	E36	.614	15403	14.9	16D	-B	*	C		127		DE
151 CULG	12	0517	0520	0545	N21	W65	.908	15409	7.3	28	-N		C	0520	40	1.0	Y5
152 CULG	12	0556E	0559U	0559D	N12	E61	.873	15410	16.8	3D	-N		P	0559	60	1.2	Y5
153 CATA	12	0755	0800	0805	S22	W56	.871	15391	8.1	10	-N	2	C	0800	56	1.1	Y5
154 MONT	12	0806	0809	0816	N19	W66	.914	15409	7.4	10	-F		C	0809	50		E Y5

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR. DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
GRP68155	12	0809+1	0811+2	0828	N18	E32	.563	15403	14.7	19	-F				50	.6	E
MONT	12	0809	0813	0830	N16	E32	.554	15403	14.7	21	-F		C	0813	60		E
MEUD	12	0809	0813	0823	N18	E33	.576	15403	14.8	14	-F		C				E
HTPR	12	0809	0811	0830	N18	E33	.576	15403	14.8	21	-F		C	0811	50	.6	ET
BUCA	12	0810	0811	0835	N18	E31	.551	15403	14.7	25	-N		C	0811	31	.4	E
UPIC	12	0815E		0825	N19	E30	.543	15403	14.6	100	-N		P	0815	102	61.0	
GRP68156	12	0900+5	0901 0908+3	0919	N18	E32	.563	15403	14.8	19	-N						E
CATA	12	0900	0910	0915D	N17	E32	.559	15403	14.8	150	1B	1	P	0910	281	3.4	
MONT	12	0900	0901	0920	N17	E31	.545	15403	14.7	20	-N		C	0901	110		E
HTPR	12	0901	0909	0917	N18	E33	.576	15403	14.9	16	-N		C	0909	90	1.1	E
BUCA	12	0902	0911	0920	N17	E30	.532	15403	14.6	18	-N		C	0911	95	1.2	
ZURI	12	0903	0909	0917	N16	E32	.563	15403	14.8	14	1N		C	0909	310	3.8	
UPIC	12	0905	0908	0931	N19	E30	.543	15403	14.6	26	1N		P	0908	224	134.0	F
MEUD	12	0912E	0912	09140	N18	E33	.576	15403	14.9	20	-N		C				E
GRP68157	12	0900+3	0913+1	0925	N17	W68	.926	15409	7.3	25	-N				70		D
MONT	12	0900	0914	0928	N17	W68	.926	15409	7.3	28	-F	*	C	0914	50		D
ZURI	12	0903	0913	0921	N18	W69	.932	15409	7.2	18	1N	*	C	0913	90		
GRP68158	12	0921+1	0923+1 0937+0	0943	N18	E31	.551	15403	14.7	22	-N				60	.7	E
MONT	12	0921	0924	0945	N17	E31	.545	15403	14.7	24	-N		C	0924	80		E
ZURI	12	0921	0923	0939D	N18	E32	.563	15403	14.8	18D	-N		P	0923	120	1.5	
BUCA	12	0922	0923	0950	N18	E31	.551	15403	14.7	28	-N		C	0923	47	.6	E
HTPR	12	0922	0924	0935	N18	E33	.576	15403	14.9	13	-N		C	0924	40	.5	E
KANZ	12	0927E	0937	0948	N18	E31	.551	15403	14.7	21D	-N	2					E
KHAR	12	0931E	0937	0941D	N18	E32	.563	15403	14.8	10D	-F		P				E
159 KANZ	12	0958	1002	1007	N19	W68	.927	15409	7.3	9	-F	2					Y5
GRP68160	12	1000+1	1005+5 1017+3	1035	N17	E31	.545	15403	14.7	35	-N				120	1.4	EU
HTPR	12	1000	1017	1035	N18	E32	.563	15403	14.8	35	-N		C	1017	80	1.0	E
CATA	12	1000	1010	1015	N13	E31	.529	15403	14.7	15	-N	2	C	1010	112	1.3	
TEHR	12	1001	1005U	1026	N11	E28	.479	15403	14.5	25	-F	2	C		64		F
KANZ	12	1001	1010	1015	N13	E30	.514	15403	14.7	14	-F	2					
MONT	12	1012	1019	1038	N17	E31	.545	15403	14.8	26	-N		C	1019	80		E
BUCA	12	1013	1018	1041	N17	E30	.532	15403	14.7	28	-B		C	1018	95	1.2	E
KANZ	12	1013	1018	1041	N18	E30	.538	15403	14.7	28	-B	2					
KHAR	12	1015E	1015	1041D	N18	E32	.563	15403	14.8	26D	-N		P	1015	165	2.0	E
CATA	12	1015	1020	1030	N17	E30	.532	15403	14.7	15	1B	2	P	1020	168	2.0	
WEND	12	1017		1027	N18	E30	.538	15403	14.7	10	-F		P				U
MCMA	12	1039E		1110	N18	E31	.551	15403	14.8	31D	-N		C	1045	125	1.5	E
GRP68161	12	1050+3	1056+2	1059	N15	E57	.840	15410	16.7	9	-F				50	.9	
MCMA	12	1050	1056	1059	N15	E56	.831	15410	16.7	9	-N		C	1056	40	.7	E
HTPR	12	1051	1056	1059	N15	E58	.849	15410	16.8	8	-F		C	105E	60	1.1	
KANZ	12	1053	1058	1100	N15	E57	.840	15410	16.7	7	-F	2					
KHAR	12	1053E	1056	1058D	N15	E58	.849	15410	16.8	5D	-N		P				D
GRP68162	12	1114+3	1118+2	1137	N22	E36	.633	15403	15.2	23	-F				25	.3	D
KHAR	12	1114E	1119	1122D	N22	E36	.633	15403	15.2	8D	-F		P				D
HTPR	12	1116	1120	1136	N22	E36	.633	15403	15.2	20	-F		C	1120	20	.3	
MCMA	12	1117	1118	1138	N20	E35	.611	15403	15.1	21	-N		C	1118	30	.4	D
GRP68163	12	1141+3	1145+0	1148	N15	E57	.840	15410	16.8	7	-F				30	.6	D
MCMA	12	1141	1145	1148	N15	E56	.831	15410	16.7	7	-F		C	1145	25	.4	D
RAMY	12	1144	1145	1147	N16	E59	.858	15410	16.9	3	-N	3	C		25		
GRP68164	12	1145+5	1148+7 1210	1217	N17	E33	.572	15403	15.0	32	-F				50	.6	E
RAMY	12	1145	1152	1217	N17	E30	.532	15403	14.7	32	-N	3	C		57		
MCMA	12	1146	1155	1225	N20	E35	.611	15403	15.1	39	-N		C	1155	110	1.2	E
HTPR	12	1146	1148	1203	N22	E36	.633	15403	15.2	17	-F		C	1148	20	.3	
BUCA	12	1150	1153	1210	N17	E31	.545	15403	14.8	20	-F		C	1153	40	.5	
HTPR	12	1210	1210	1217	N14	E33	.560	15403	15.0	7	-F		C	1217	20	.2	E
165 RAMY	12	1148	1200	1222	N19	W67	.920	15409	7.5	34	-B	3	C		96		Y5
166 RAMY	12	1149	1152	1203	N16	E59	.858	15410	16.9	14	-N	3	C		23		Y5
GRP68167	12	1213+4	1215+3	1219	S23	W41	.746	15400	9.4	6	-F						E
MCMA	12	1213	1215	1219	S24	W41	.752	15400	9.4	6	-F		C	1215	35	.5	E
ZURI	12	1213	1215	1217	S23	W40	.737	15400	9.5	4	-F		C	1215	120	1.9	
RAMY	12	1217	1218	1222	S21	W41	.735	15400	9.4	5	-N	3	C		24		

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
168 RAMY	12	1223	1228	1230	N19	W67	.920	15409	7.5	7	-B	3	C		43		Y5
169 RAMY	12	1247	1248	1256	N19	W67	.920	15409	7.5	9	-B	3	C		26		Y5
170 RAMY	12	1303	1309	1323	N19	W68	.927	15409	7.4	20	-B	3	C		49		Y5
GRP68171	12	1315>9	1325+3	1358	N18	E29	.525	15403	14.7	43	-N				90	1.1	EH
HCMA	12	1300	1327	1410	N18	E29	.525	15403	14.7	70	-B	*	C	1327	90	1.1	EH
HTPR	12	1315	1325	1345	N18	E30	.538	15403	14.8	30	-F	*	C	1325	50	.6	E
KHAR	12	1317E	1326	1359D	N18	E29	.525	15403	14.7	42D	-N	*	P				E
KHAR	12	1317E	1317	1320D	N14	E29	.504	15403	14.7	3D	-F	*	P				E
RAMY	12	1319	1327	1411	N17	E29	.519	15403	14.7	52	-N	*	C		81		FDE
TEHR	12	1321	1328	1408	N18	E28	.511	15403	14.7	47	-N	*	C		95		F
ZURI	12	1325	1325	1349	N18	E30	.538	15403	14.8	24	-N	*	C	1325	140	1.8	
HUAN	12	1327E		1338	N17	E28	.506	15403	14.7	11D	-N	*	P	1329	75	.9	E
GRP68172	12	1324	1331+5 1353+6	1405	N19	W70	.938	15409	7.3	41	-N						
RAMY	12	1324	1336	1444	N19	W68	.927	15409	7.5	80	-N	3	C		48		
KHAR	12	1331E	1331	1337D	N20	W69	.933	15409	7.4	6D	-F		P				E
LVOV	12	1351E	1353	1400	N18	W70	.938	15409	7.3	9D	1F		C	1353	100		D
KANZ	12	1353	1358	1402	N19	W71	.944	15409	7.3	9	-F	2					
HCMA	12	1353	1356	1400	N18	W72	.949	15409	7.2	7	-B		C	1356	25	.8	D
ZURI	12	1353	1355	1403	N18	W71	.944	15409	7.3	10	-N		C	1355	50		
KHAR	12	1354E	1355	1359D	N17	W73	.954	15409	7.1	5D	-N		P				E
HERS	12	1354E	1354	1403	N21	W65	.908	15409	7.7	9D	1N		P	1356	72	2.3	E
HTPR	12	1354	1355	1404	N19	W70	.938	15409	7.3	10	-F		C	1355	20		
TEHR	12	1356	1359	1416	N20	W68	.927	15409	7.5	20	-N	2	C		64		
GRP68173	12	1435+1	1437+2	1445	N18	E28	.511	15403	14.7	10	-N				30	.4	EL
KANZ	12	1435	1438	1446	N18	E28	.511	15403	14.7	11	-N	2					
HCMA	12	1435	1439	1500	N18	E29	.525	15403	14.8	25	-B		C	1439	40	.5	EL
HTPR	12	1435	1437	1445	N18	E30	.538	15403	14.9	10	-F		C	1437	20	.2	E
RAMY	12	1435	1438	1445	N17	E28	.506	15403	14.7	10	-B	3	C		28		
HUAN	12	1436	1437	1438	N17	E27	.492	15403	14.6	2	-F	1	C	1437	20	.2	D
174 HCMA	12	1523	1525	1530	S32	E19	.647	15401	14.1	7	-F		C	1525	40	.5	E Y5
175 HTPR	12	1530	1535	1540	N18	E30	.538	15403	14.9	10	-F		C	1535	20	.2	Y5
176 HCMA	12	1546	1547	1553	N18	W73	.954	15409	7.2	7	-N		C	1547	25	.8	EHLV Y5
GRP68177	12	1553+2	1606+3	1639	N16	E28	.500	15403	14.8	46	-N						EHJKL
HCMA	12	1553	1609	1930D	N17	E28	.506	15403	14.8	217D	-B		C	1609	150	1.8	EKLJ
HTPR	12	1554	1607	1630	N17	E30	.532	15403	14.9	36	-N		C	1607	60	.7	EF
HUAN	12	1555		1616D	N14	E31	.532	15403	15.0	21D	-N	1	P	1602	80	.9	E
RAMY	12	1555E	1555U	1559	N16	E27	.487	15403	14.7	4D	-N	3	C		22		F H
RAMY	12	1601	1602	1639	N16	E27	.487	15403	14.7	38	-B	3	C		589		F H
RAMY	12	1601	1606	1639	N16	E27	.487	15403	14.7	38	-N	3	C		100		F H
HUAN	12	1606		1616D	N17	E27	.492	15403	14.7	10D	-F	1	P	1609	120	1.4	E
178 RAMY	12	1644	1646	1650	N19	W69	.933	15409	7.5	6	-N	2	C		21		F Y5
179 RAMY	12	1658	1701	1713	N19	W70	.938	15409	7.5	15	-N	2	C		25		F Y5
GRP68180	12	1700+2	1703+4	1711	S24	W42	.761	15400	9.6	11	-N				50	.8	V
HCMA	12	1700	1703	1711	S24	W44	.779	15400	9.4	11	-N		C	1703	50	.7	EV
HTPR	12	1701	1703	1711	S24	W40	.743	15400	9.7	10	-F		C	1703	40	.5	
RAMY	12	1702	1707	1711	S21	W42	.745	15400	9.6	9	-N	2	C		66		F
181 HCMA	12	1713	1719	1727	N18	W74	.959	15409	7.2	14	-F		C	1719	30	1.2	D Y5
182 HTPR	12	1739	1740	1750	N17	W72	.949	15409	7.3	11	-F		C	1741	20		E Y5
GRP68183	12	1756+5	1800+2	1811D	N16	E28	.500	15403	14.8	15	-N				70	.8	
RAMY	12	1756	1800	1811	N16	E26	.473	15403	14.7	15	-N	*	C		53		F
PALE	12	1759	1802	1850	N17	E29	.519	15403	14.9	51	-N	*	V		88		FDE
HUAN	12	1801		1805D	N14	E28	.490	15403	14.9	4D	-N	*	P	1802	60	.7	
184 HCMA	12	1757	1802	1825	N12	E58	.847	15410	17.1	28	-F		C	1802	25	.5	D Y5
GRP68185	12	2049+1	2055+3	2125	N17	E25	.466	15403	14.7	36	1B				230	2.6	EUX
PALE	12	2049	2058	2120	N17	E27	.492	15403	14.9	31	1B	3	C		288		UDE
HCMA	12	2050	2055	2130	N17	E24	.452	15403	14.7	40	1B		C	2055	175	2.1	EX
186 PALE	12	2052	2052	2107	S20	W45	.769	15400	9.5	15	-N	3	C		47		FDE Y5

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
GRP68187	12	2147+1	2149+3	2211	N14	E28	.490	15403	15.0	24	-N				100	1.2	
MCMA	12	2147	2150	2215	N14	E28	.490	15403	15.0	28	-N		C	2150	100	1.2	E
VORO	12	2147	2149	2203	N14	E28	.490	15403	15.0	16	-B		C	2149	116	1.3	
CULG	12	2147E	2151	2238	N12	E29	.497	15403	15.1	510	-N		C	2151	100	1.2	F
PALE	12	2148	2152	2207	N17	E27	.492	15403	14.9	19	-B	3	C		86		FDE
188 CULG	12	2256	2257	2300	N13	E26	.457	15403	14.9	4	-F		C	2257	20	.2	Y5
GRP68189	12	2326+2	2329+1	2335	N17	E23	.439	15403	14.7	9	-N						J
CULG	12	2326	2330	0002D	N16	E22	.418	15403	14.6	36D	-N		C	2330	30	.3	
VORO	12	2327	2329	2333	N18	E23	.446	15403	14.7	6	-N		C	2329	45	.5	EJ
PALE	12	2328	2330	2334	N17	E26	.479	15403	14.9	6	-B	3	C		175		FDE
MANI	12	2330E	2330U	2335	N17	E24	.452	15403	14.8	5D	-N		V		120	1.3	F
190 CULG	12	2359	2400	0002D	S32	E12	.613	15401	13.9	3D	-F		P	2400	10	.1	G Y5
191 VORO	13	0019	0020	0023	N18	E23	.445	15403	14.7	4	-N		C	0020	90	1.0	E Y5
GRP68192	13	0025+0	0026+1	0031	N16	W78	.976	15409	7.2	6	-F				35		D
MANI	13	0025	0027	0032	N16	W78	.976	15409	7.2	7	-F		P		20	.5	
VORO	13	0025	0026	0029	N17	W78	.976	15409	7.2	4	-N		C	0026	45		D
GRP68193	13	0225+0	0227+1	0300	N17	E87	.997	15415	19.6	35	-F						D
VORO	13	0225	0227	0238D	N18	E87	.997	15415	19.6	13D	-F		C	0227	63		D
CULG	13	0225E	0228U	0300	N17	E88	.999	15415	19.7	35D	-N		P	0228	20		
194 CULG	13	0242	0305U	0322	N18	W80	.982	15409	7.1	40	-F		C	0305	50		T Y5
195 CULG	13	0320	0325	0343	N18	E22	.432	15403	14.8	23	-F		C	0325	30	.3	T Y5
196 CULG	13	0410E	0416	0443	N19	W80	.982	15409	7.2	33D	-F		C	0416	50		T Y5
GRP68197	13	0445	0449+1	0530	N20	W81	.985	15409	7.1	45	1F				80		D
CULG	13	0445	0450	0530	N19	W80	.982	15409	7.2	45	1N		C	0450	80		T
TACH	13	0447E	0449	0500D	N21	W82	.988	15409	7.0	13D	1F		C	0449	88		D
GRP68198	13	0540+1	0544+1	0548	N14	E23	.419	15403	15.0	8	-F				40	.4	K
CULG	13	0540	0544	0548	N14	E23	.419	15403	15.0	8	-F		C	0544	40	.4	FT
HTPR	13	0541	0544	0548	N14	E23	.419	15403	15.0	7	-F		C	0544	20	.2	
TACH	13	0542E	0545	0550D	N16	E21	.404	15403	14.8	8D	-N		C	0545	64	.8	EK
GRP68199	13	0625+1	0627+1	0632	N15	E23	.425	15403	15.0	7	-F				35	.4	F
CULG	13	0625	0627	0632D	N15	E23	.425	15403	15.0	7D	-F		P	0627	50	.6	FT
HTPR	13	0626	0628	0632	N16	E24	.445	15403	15.1	6	-F		C	0628	20	.2	
GRP68200	13	0650+3	0659+1	0705	N19	W81	.985	15409	7.2	15	1N				70		DJ
CULG	13	0650E	0657U	0657D	N19	W82	.988	15409	7.1	7D	-N		P	0657	50		T
ABST	13	0653	0659	0705	N19	W81	.985	15409	7.2	12	1F		C	0659	96		DJ
CATA	13	0655E	0700	0705	N16	W80	.983	15409	7.3	10D	1N	2	P	0700	56		
201 KHAR	13	0731E	0731	0737D	N20	W85	.994	15409	6.9	6D	-F		P				D Y5
GRP68202	13	0742+1	0744+1	0754	N16	E24	.445	15403	15.1	12	-N				60	.7	J
HTPR	13	0742	0744	0754	N16	E22	.417	15403	15.0	12	-N		C	0744	40	.4	E
ABST	13	0743	0745	0749D	N15	E25	.453	15403	15.2	6D	-N		P	0743	87	1.0	DJ
KANZ	13	0743		0746D	N17	E23	.438	15403	15.0	3D	-F	1					
KHAR	13	0744E	0744	0748D	N17	E25	.465	15403	15.2	4D	-N		P				
GRP68203	13	0811>9	0827+6 0848	0907	N18	W85	.994	15409	7.0	56	-F				40		
MONT	13	0811	0827	0844	N19	W81	.985	15409	7.3	33	-F		C	0827	40		D
MONT	13	0829	0833	0838	N15	W86	.996	15409	6.9	9	-F		C	0833	40		
ZURI	13	0836	0848	0906	N16	W86	.996	15409	6.9	30	1F		C	0848	130		
KANZ	13	0838E		0907D	N20	W85	.994	15409	7.0	29D	-F	1					
KHAR	13	0903E		0910D	N20	W86	.996	15409	6.9	7D	-F		P				
204 MONT	13	0835	0836	0841	N35	W90	.999		6.6	6	-F		C	0836	50		D Y5
GRP68205	13	0913+1	0913+3	0922	N14	E22	.404	15403	15.0	9	-F						D
HTPR	13	0913	0913	0920	N14	E21	.390	15403	15.0	7	-F		C	0913	10	.1	
MEUD	13	0914	0916	0918D	N14	E22	.404	15403	15.0	4D	-F		C				D
ZURI	13	0914	0914	0922	N14	E22	.404	15403	15.0	8	-F		C	0914	90	1.0	
KANZ	13	0915E	0924	0928	N15	E22	.411	15403	15.0	13D	-F	1					
206 ZURI	13	0930	0934	0942	N20	W83	.990	15409	7.2	12	-F		C	0934	60		Y5

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
	JUL																	
GRP68207	13	0954	1020+0	1052	N16	E21	.404	15403	15.0	58	-F							
KANZ	13	0954	1020	1053	N16	E21	.404	15403	15.0	59	-F	1						
KHAR	13	1002E	1002	1012D	N18	E16	.357	15403	14.6	100	-F		P					
TEHR	13	1018	1020	1051	N14	E22	.404	15403	15.1	33	-N	2	C		64			
GRP68208	13	1022+1	1025+1	1036	N18	E50	.775	15410	17.2	14	-F							
TEHR	13	1022	1025	1036	N18	E50	.775	15410	17.2	14	-N	2	C		95			
KANZ	13	1023	1026	1035	N18	E50	.775	15410	17.2	12	-F	1						
GRP68209	13	1053	1107 1116	1135	N16	E21	.404	15403	15.0	42	-N						E	
KANZ	13	1053	1107	1135	N16	E18	.363	15403	14.8	42	-B	*					E	
KHAR	13	1103E	1123	1149D	N17	E22	.425	15403	15.1	460	-F	*	P	1114			E	
ZURI	13	1114E	1116	1134	N14	E21	.390	15403	15.0	200	-F	*	P	1116	50	.6		
218 HUAN	13	1627	1634	1644	N14	E16	.319	15403	14.9	17	-F	1	C	1634	50	.5	E	Y5
	13	1812	2001	NO FLARE PATROL														
211 PALE	13	2004E	2005U	2044D	N17	E14	.323	15403	14.9	400	-N	3	C		51		F	Y5
	13	2005	2137	NO FLARE PATROL														
	13	2231	2241	NO FLARE PATROL														
212 CULG	13	2300	2310	2350	N13	E13	.269	15403	14.9	50	-F		C	2310	120	1.3		Y5
213 CULG	13	2350	2352	2358	N19	E17	.379	15403	15.3	8	-F		C	2352	30	.3		Y5
214 CULG	14	0502	0503	0513	N16	E13	.299	15403	15.2	11	-F		C	0503	30	.3		Y5
GRP68215	14	0526+1	0529+0	0543	N15	E10	.252	15403	15.0	17	-N				50	.5	FJ	
CULG	14	0526	0529	0545	N15	E10	.252	15403	15.0	19	-N		C	0529	50	.5	F	
MANI	14	0527	0529	0540	N15	E10	.252	15403	15.0	13	-N		P		50	.5	F	
ABST	14	0527	0529	0538	N16	E08	.245	15403	14.8	11	-F		C	0529	87	.9	EJ	
ABST	14	0527	0529	0543	N13	E09	.216	15403	14.9	16	-F		C	0529	87	.9	DJ	
216 HONT	14	0803	0807	0822	N15	E10	.252	15403	15.1	19	-N		C	0807	110		E	Y5
217 TEHR	14	0858	0900	0905	N18	E04	.248	15403	14.7	7	-N	3	C		32			Y5
GRP68218	14	0913+2	0915+1	0927	S23	W64	.928	15400	9.6	14	-F				50			
ZURI	14	0913	0915	0929	S25	W66	.942	15400	9.4	16	-F		C	0915	50			
TEHR	14	0915	0916	0924	S22	W63	.920	15400	9.7	9	-N	3	C		64			
219 CATA	14	0940E	1000	1005D	N11	E09	.194	15403	15.1	25D	-N	2	P	1000	45	.5		Y5
GRP68220	14	1100+3	1105+5	1150	N15	E07	.222	15403	15.0	50	-N				150	1.5		
MCMA	14	1100	1110	1225D	N14	E07	.208	15403	15.0	85D	-B		C	1110	100	1.1	E	
KANZ	14	1101	1110	1221	N15	E07	.222	15403	15.0	80	-B	2					FT	
ZURI	14	1101	1109	1145	N15	E07	.222	15403	15.0	44	1N		P	1109	200	2.2		
TEHR	14	1103	1105	1124	N16	E03	.211	15403	14.7	21	-N	3	C		95		F	
MEUD	14	1103E		1116D	N15	E08	.231	15403	15.1	13D	-N		C				CE	
UPIC	14	1112E		1125D	N14	E06	.198	15403	14.9	13D	1N		P	1112	245	125.0		
221 MCMA	14	1123	1127	1140D	S25	E55	.873	15413	18.6	17D	-F		C	1127	20	.4	D	Y5
GRP68222	14	1132+1	1136+2	1152	N15	E71	.943	15415	19.8	20	-N				50		E	
KANZ	14	1132	1138	1147	N15	E70	.937	15415	19.7	15	-N	2						
MCMA	14	1133	1138	1156	N15	E72	.949	15415	19.9	23	-B		C	1138	30	1.0	E	
ZURI	14	1133	1137	1159	N15	E72	.949	15415	19.9	26	1F		P	1137	70			
TEHR	14	1134E	1136	1142	N17	E68	.926	15415	19.6	8D	-N	2	C		64			
GRP68223	14	1143>9	1202+1	1231	S25	E55	.873	15413	18.6	48	-N						DGH	
MCMA	14	1143	1203	1240D	S25	E55	.873	15413	18.6	57D	-N		C	1203	20	.4	DH	
KANZ	14	1200	1202	1221	S25	E56	.880	15413	18.7	21	-B	2					G	
GRP68224	14	1340+2	1345+1	1400	S25	E51	.843	15413	18.4	20	-N						DGH	
LOCA	14	1340	1345	1400	S25	E51	.843	15413	18.4	20	1N		V	1345	102	2.1		
KANZ	14	1342	1346	1350	S24	E51	.839	15413	18.4	8	-F	2					G	
MCMA	14	1342	1345	1400	S25	E54	.866	15413	18.6	18	-N		C	1345	20	.4	DH	
225 RAMY	14	1404	1408	1417	N18	E03	.244	15403	14.8	13	-N	3	C		26			Y5

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS
	DATE JUL	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg	
GRP68226	14	1411	1438+2	1446	S23	E51	.836	15413	18.4	35	-N				20	.4	DGHK
MCMA	14	1411		1447	S25	E54	.866	15413	18.6	36	-B		C	1439	20	.4	DHK
RAMY	14	1436E	1438	1445	S23	E52	.844	15413	18.5	9D	-N	3	C		24		H
KANZ	14	1437	1438	1445	S24	E51	.839	15413	18.4	8	-N	2					G
TEHR	14	1437E	1440	1447	S23	E48	.811	15413	18.2	10D	-F	1	C		32		
GRP68227	14	1557	1600 1631+1	1656	N14	E04	.183	15403	15.0	59	-N						E
RAMY	14	1557	1600	1702	N15	E02	.190	15403	14.8	65	-N	*	C		89		
MCMA	14	1625E	1631	1718D	N14	E04	.183	15403	15.0	53D	1N	*	C	1631	200	2.0	E
MEUD	14	1628	1632	1650	N15	E05	.206	15403	15.1	22	-N	*	C				E
HUAN	14	1629	1632	1647	N13	E04	.167	15403	15.0	18	-N	*	C	1632	65	.6	E
GRP68228	14	1604+0	1605+1	1612	S24	E52	.847	15413	18.6	8	-N				30	.6	D
MEUD	14	1604	1605	1611	S24	E50	.831	15413	18.4	7	-N		C				D
HUAN	14	1604	1606	1611	S24	E53	.855	15413	18.6	7	-F	1	C	1606	20	.4	D
MCMA	14	1604	1606	1612	S25	E53	.858	15413	18.6	8	-N		C	1606	25	.5	D
RAMY	14	1604	1606	1612	S23	E52	.844	15413	18.6	8	-N	3	C		26		
GRP68229	14	1650+6	1657+2	1703	S24	E52	.847	15413	18.6	13	-F				25	.5	D
MCMA	14	1650	1657	1702D	S25	E53	.858	15413	18.7	12D	-N		C	1657	25	.5	D
HUAN	14	1656	1659	1703	S24	E52	.847	15413	18.6	7	-F	1	C	1659	20	.3	D
GRP68230	14	1733+0	1733+1	1737	N17	W01	.222	15403	14.7	4	-N				60	.6	
PALE	14	1733	1733	1738	N17	E03	.227	15403	15.0	5	-N	3	C		133		F
RAMY	14	1733	1733	1737	N18	E01	.239	15403	14.8	4	-N	3	C		73		
MCMA	14	1733	1734	1737	N15	W03	.194	15403	14.5	4	-E		C	1734	40	.4	D
HUAN	14	1733	1733	1735	N07	W04	.085	15403	14.4	2	-N	2	C	1733	50	.5	
GRP68231	14	1800+6	1806+2	1812	S24	E51	.839	15413	18.6	12	-F				30	.5	DH
MCMA	14	1800	1806	1815	S25	E51	.843	15413	18.6	15	-N		C	1806	40	.7	DH
HUAN	14	1805	1808	1812	S24	E51	.839	15413	18.6	7	-F	1	C	1808	25	.4	D
RAMY	14	1806	1807	1811	S23	E51	.836	15413	18.6	5	-F	3	C		26		H
232 HUAN	14	1929	1931	1935	N18	W03	.244	15403	14.6	6	-F	1	C	1931	15	.2	D Y5
233 HUAN	14	1955	1958	2005	N17	E05	.237	15403	15.2	10	-F	1	C	1958	20	.2	D Y5
234 CULG	14	2225	2235	2240	S19	W76	.979	15400	9.2	15	-F		C	2235	20		Y5
235 CULG	14	2301	2305	2318	N18	W02	.241	15403	14.8	17	-F		C	2305	20	.2	Y5
236 CULG	14	2320	2325	2345	N19	E03	.260	15403	15.2	25	-F		C	2320	30	.3	Y5
GRP68237	15	0035	0055+6	0134	N16	W01	.203	15403	14.9	59	1B				240	2.5	UYZ
CULG	15	0035	0057	0150	N14	E00	.168	15403	15.0	75	1B		C	0057	230	2.3	UY
MITK	15	0036E	0101	0127D	N14	W01	.169	15403	15.0	51D	1B		C	0101	280	2.9	
PALE	15	0046E	0135U	0140	N17	W03	.225	15403	14.8	54D	-N	3	C		29		FDE
MANI	15	0053E	0055	0115	N22	E02	.306	15403	15.2	22D	1B		V		200	2.1	ZE
CULG	15	0132	0140	0233	N18	W01	.237	15403	15.0	61	-N		C	0140	30	.3	F
238 CULG	15	0230	0235	0250	N18	W03	.242	15403	14.9	20	-N		C	0235	20	.2	Y5
GRP68239	15	0404+1	0405+5	0423	N18	W05	.251	15403	14.8	19	-B				60	.6	
CULG	15	0404	0410	0429	N18	W06	.257	15403	14.7	25	-N		C	0410	80	.8	
PALE	15	0405E	0405U	0418	N17	W04	.230	15403	14.9	13D	-B	3	C		26		FDE
TEHR	15	0405	0409	0423	N18	W05	.251	15403	14.8	18	-B	2	C		64		
240 PALE	15	0407	0413	0418	S23	E44	.776	15413	18.5	11	-N	3	C		133		Y5
241 CULG	15	0511	0516	0530	N13	E25	.441	15410	17.1	19	-F		C	0516	60	.7	Y5
GRP68242	15	0522	0531+6	0555	S24	E42	.763	15413	18.4	33	-N						U
CULG	15	0522	0534	0606	S25	E43	.777	15413	18.4	44	-N		C	0534	60	1.0	
TACH	15	0525E	0531	0555D	S23	E42	.758	15413	18.4	30D	1N		C	0531	159	2.5	EU
TEHR	15	0536E	0537	0551	S24	E41	.754	15413	18.3	15D	-N	3	C		95		F
243 CULG	15	0620	0626	0632D	S20	W87	1.000	15400	8.7	12D	-F		P	0626	30		Y5
GRP68244	15	0651>9	0715+4 0726+7	0743	N28	W02	.403	15403	15.1	52	-F				80	.9	E
HTPR	15	0651	0715	0745	N28	W03	.405	15403	15.1	54	-F		C	0715	40	.4	E
ABST	15	0708	0719	0752	N28	W04	.407	15403	15.0	44	-F		C	0719	79	.9	D
MONT	15	0712	0726	0744	N28	W02	.403	15403	15.2	32	-F		C	0726	50		E
ABST	15	0713	0733	0755	N28	W02	.403	15403	15.2	42	-F		C	0733	105	1.2	D
TEHR	15	0725	0729	0737	N28	W02	.403	15403	15.2	12	-F	3	C		95		F
BUCA	15	0730E		0742	N28	W02	.403	15403	15.2	12D	-F		C	0731	15	.2	E
CATA	15	0735E	0735	0740D	N22	W02	.306	15403	15.2	5D	-N	2	P	0735	84	.9	

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUL	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
245 ABST	15	0802	0804	0820	N19	W03	.258	15403	15.1	18	-F		C	0804	114	1.2	D Y5
GRP68246	15	1040+2	1050	1205	N17	E24	.450	15410	17.2	85	-N						EJ
			1059+7														
ABST	15	1040	1059	1102D	N16	E24	.443	15410	17.2	22D	-F		P	1059	87	1.0	DJ
HTPR	15	1040	1050	1150	N16	E24	.443	15410	17.2	70	-F		C	1050	40	.4	E
MONT	15	1042	1106	1116D	N16	E24	.443	15410	17.2	34D	-F		C	1106	50		E
KHAR	15	1049E	1105	1138D	N18	E23	.444	15410	17.2	49D	-N		P	1105			
CATA	15	1050E	1115	1115D	N17	E24	.450	15410	17.3	25D	-B	2	P	1115	168	1.9	T
MCMA	15	1055E		1205D	N17	E23	.436	15410	17.2	70D	-N		P	1120	120	1.3	E
KIEV	15	1117E	1120	1216	N17	E25	.463	15410	17.3	59D	-F		C	1120	100	1.5	D
GRP68247	15	1046+2	1056+3	1113	N14	W06	.197	15403	15.0	27	-F				60	.6	EJ
ABST	15	1046	1059	1102D	N13	W06	.183	15403	15.0	16D	-F		P	1059	87	.9	DJ
MONT	15	1048	1056	1110	N14	W05	.189	15403	15.1	22	-F		C	1056	60		E
MCMA	15	1055E		1115	N15	W10	.251	15403	14.7	20D	-F		P	1056	40	.4	E
248 RAMY	15	1318	1322	1346	N19	E52	.796	15415	19.5	28	-N	4	C		33		Y5
249 HTPR	15	1329	1330	1334	N26	W37	.663	15394	12.8	5	-F		C	1330	20	.2	Y5
GRP68250	15	1343+1	1344+1	1354	N15	W08	.230	15403	15.0	11	-N				50	.5	EH
HTPR	15	1343	1344	1352	N15	W08	.230	15403	15.0	9	-F		C	1344	20	.2	E
MCMA	15	1344	1345	1350D	N14	W07	.206	15403	15.0	6D	-N		C	1345	50	.5	E
RAMY	15	1344	1345	1355	N18	W10	.289	15403	14.8	11	-N	4	C		69		H
GRP68251	15	1424+1	1425+0	1443	N18	W11	.299	15403	14.8	19	1B				250	2.6	V
			1431														
MCMA	15	1424	1425	1500	N18	W12	.310	15403	14.7	36	1B		C	1425	200	2.1	E
HTPR	15	1424	1425	1440	N18	W13	.320	15403	14.6	16	1B		C	1425	230	2.3	EV
TEHR	15	1425	1431U	1443	N19	W10	.303	15403	14.9	18	1B	1	C		300		F
RAMY	15	1425	1425	1428D	N18	W10	.289	15403	14.9	3D	1B	4	V		310		F
252 HTPR	15	1446	1450	1453	N23	W09	.352	15403	14.9	7	-F		C	1450	30	.3	
253 HUAN	15	1950		2007	N18	W15	.343	15403	14.7	17	-F	1	C	1956	45	.5	E
	15	2047	2106	NO FLARE PATROL													
254 CULG	16	0422	0429	0507	N10	E51	.776	15415	20.0	45	-F		C	0429	50	.8	Y5
GRP68255	16	0430+3	0434+3	0446	N18	E42	.685	15415	19.3	16	-F				60	.8	
CULG	16	0430	0437	0446	N18	E42	.685	15415	19.3	16	-F		P	0437	50	.7	
TACH	16	0431E	0435	0440D	N18	E48	.753	15415	19.8	9D	1F		C	0435	220	3.2	E
PALE	16	0433	0434	0435D	N20	E41	.680	15415	19.3	2D	-N	3	C		56		FDE
256 CULG	16	0600	0603	0611	N14	E45	.712	15415	19.6	11	-F		C	0603	20	.2	Y5
257 ABST	16	0724	0730	0736	N18	E42	.685	15415	19.5	12	-F		C	0730	140	1.9	F Y5
GRP68258	16	0758	0807+6	0842	N18	W22	.430	15403	14.7	44	-F				90	1.0	DJ
ABST	16	0758	0807	0842	N18	W22	.430	15403	14.7	44	-F		C	0807	96	1.1	DJ
KHAR	16	0810E	0813	0840D	N18	W22	.430	15403	14.7	30D	-F		P	0813	80	.9	D
259 KHAR	16	1207E	1207	1213D	N20	E42	.691	15415	19.7	6D	-F		P				D Y5
GRP68260	16	1221+1	1229+1	1246	N28	W18	.487	15403	15.2	25	-N						E
MCMA	16	1221	1230	1246	N28	W19	.496	15403	15.1	25	-N		C	1230	60	.7	E
MEUD	16	1222	1229	1245	N28	W18	.487	15403	15.2	23	-N		C				E
KHAR	16	1230E	1230	1237D	N28	W16	.471	15403	15.3	7D	-F		P	1230	165	1.9	
261 RAMY	16	1254	1256	1314	N18	W22	.430	15403	14.9	20	-B	3	C		98		F Y5
GRP68262	16	1559+3	1601+1	1609	N16	W24	.443	15403	14.9	10	-F						
KANZ	16	1559	1601	1607D	N14	W24	.431	15403	14.9	8D	-F	1					
RAMY	16	1602	1602	1609	N18	W24	.456	15403	14.9	7	-N	3	C		21		
GRP68263	16	1612+1	1612+1	1630	N15	W23	.422	15403	14.9	18	-N						D
MEUD	16	1612	1612	1625	N13	W23	.411	15403	15.0	13	-N		C				D
RAMY	16	1613	1613	1634	N18	W24	.456	15403	14.9	21	-B	3	C		49		
264 RAMY	16	1647	1647	1650	N18	W24	.456	15403	14.9	3	-N	3	C		30		Y5
GRP68265	16	1947+1	1948+0	1952	N17	W25	.463	15403	14.9	5	-B				80	.9	
RAMY	16	1947	1948	1953	N18	W26	.482	15403	14.9	6	-B	3	C		90		
PALE	16	1948	1948	1950	N17	W25	.463	15403	15.0	2	-B	3	C		68		FDE

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR. DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
GRP68266	16	2346+3	2350+1	0004	N13	W27	.470	15403	15.0	18	-N				60	.7	E	
CULG	16	2346	2350	0010	N13	W28	.484	15403	14.9	24	-F		C	2350	40	.5		
VORO	16	2349	2351	2357	N13	W27	.470	15403	15.0	8	-B		C	2351	81		E	
267 CULG	16	2349	2354	0020U	S17	W62	.905	15397	12.3	31D	-N		C	2354	50	1.2	J	Y5
GRP68268	17	0018+4	0022+3	0035	S25	E20	.578	15413	18.5	17	-N						JU	
MITK	17	0018E	0023	0036D	S26	E20	.590	15413	18.5	18D	1F		C	0023	230	2.9	E	
CULG	17	0020E	0025	0117D	S28	E19	.606	15413	18.4	57D	-N		C	0025	150	1.9	U	
VORO	17	0022	0023	0030	S25	E21	.586	15413	18.6	8	-B		C	0023	63	.7	DJ	
PALE	17	0022	0022	0033	S23	E20	.555	15413	18.5	11	-N	3	C		29		FDE	
GRP68269	17	0033+4	0038+1	0050	S28	E69	.960	15422	22.2	17	-F				70		D	
CULG	17	0033	0039	0056D	S29	E69	.962	15422	22.2	23D	-F		C	0039	50			
VORO	17	0037	0038	0044	S28	E70	.964	15422	22.3	7	-F		C	0038	99		D	
GRP68270	17	0154+3	0157+6	0224	N14	W28	.488	15403	15.0	30	-N						J	
CULG	17	0154	0203	0235	N14	W27	.473	15403	15.1	41	-N		C	0203	130	1.5		
PALE	17	0156	0157	0218	N17	W29	.516	15403	14.9	22	-B	3	C		66		FDE	
MITK	17	0157E		0230D	N14	W30	.516	15403	14.8	33D	-N		C	0157			E	
VORO	17	0157	0200	0217	N13	W28	.484	15403	15.0	20	1B		C	0200	233	2.7	J	
GRP68271	17	0242+6	0249+4	0308	N13	W29	.498	15403	14.9	26	-N				120	1.4	H	
CULG	17	0242	0252	0323	N13	W29	.498	15403	14.9	41	-N		C	0252	120	1.3		
PALE	17	0246	0249	0307	N17	W29	.516	15403	14.9	21	-N	3	C		97		FDE	
MITK	17	0246E	0253	0309D	N14	W30	.516	15403	14.9	23D	-N		C	0253			EH	
VORO	17	0248		0258	N11	W29	.492	15403	14.9	10	-B		C	0251	125	1.4		
272 CULG	17	0444E	0520U	0629	N23	E62	.887	15420	21.8	105D	-F		C	0520	60	1.4	G	Y5
GRP68273	17	0501+3	0509 0522	0531	N15	W03	.189	15410	17.0	30	-F						DJK	
CULG	17	0501	0509	0531	N15	W03	.189	15410	17.0	30	-F		C	0509	20	.2	K	
ABST	17	0504	0522	0530	N16	W04	.211	15410	16.9	26	-F		P	0522	87	.9	DJ	
274 ABST	17	0558	0601	0608	N14	W32	.544	15403	14.8	10	-F		P	0601	79	1.0	DJ	Y5
275 ABST	17	0642	0644	0646	N17	E30	.529	15415	19.5	4	-F		C	0644	87	1.0	DG	Y5
GRP68276	17	0748+4	0754+0	0810	N29	W30	.609	15403	15.1	22	-F						EH	
ZURI	17	0748	0754	0820	N29	W30	.609	15403	15.1	32	1F		C	0754	220	2.9		
HONT	17	0752	0754	0800	N29	W30	.609	15403	15.1	8	-F		C	0754	50		EH	
277 ABST	17	0752	0801	0815D	N21	W38	.648	15403	14.5	23D	-F		P	0801	87	1.2	DJ	Y5
GRP68278	17	0901+1	0915+1 0930	0958	S19	W65	.928	15397	12.5	57	1N				110			
HONT	17	0901	0916	1021	S19	W65	.928	15397	12.5	80	-N		C	0916	110			
ZURI	17	0902	0930	0958	S20	W65	.929	15397	12.5	56	1N		C	0930	120			
CATA	17	0910E	0915	0925D	S20	W65	.929	15397	12.5	15D	1N	2	P	0915	112			
TEHR	17	0939	0943	0957	S18	W63	.914	15397	12.7	18	1B	2	C		127			
GRP68279	17	1030+1	1032 1039+2	1048	N14	W33	.557	15403	15.0	18	-N						EJ	
ZURI	17	1030	1032	1044	N14	W33	.557	15403	15.0	14	-B		C	1032	130	1.6		
WEND	17	1030		1048	N14	W30	.516	15403	15.2	18	-N							
HONT	17	1031	1039	1044	N15	W33	.561	15403	15.0	13	-N		C	1033	60		E	
TEHR	17	1038E	1041	1043D	N18	W34	.586	15403	14.9	5D	1B	2	V		222			
MCMA	17	1040E		1055	N14	W34	.571	15403	14.9	15D	-N		C	1041	60	.7	E	
ABST	17	1047E	1048	1053D	N14	W33	.557	15403	15.0	6D	1F		P	1048	236	2.9	EJ	
GRP68280	17	1120>9	1126 1216	1235	N20	W30	.545	15403	15.2	75	-F						DK	
MCMA	17	1120	1126	1245	N21	W30	.552	15403	15.2	85	-N		C	1126	30	.4	DK	
ZURI	17	1210	1216	1224	N19	W31	.552	15403	15.2	14	-F		C	1216	70	.9		
281 MCMA	17	1256	1258	1320	N14	W35	.585	15403	14.9	24	-F		C	1258	40	.5	E	Y5
282 RAMY	17	1301E	1301U	1310	N16	W07	.232	15410	17.0	9D	-N	3	C		23			Y5
GRP68283	17	1350+3	1356+0 1405+5	1424D	N16	W35	.591	15403	15.0	34	-N				120	1.5	L	
KANZ	17	1342	1409	1435	N18	W34	.586	15403	15.0	53	-B	2						
MCMA	17	1350	1356	1420D	N14	W37	.611	15403	14.8	30D	-N		C	1356	75	1.0	EL	
RAMY	17	1352	1410	1450	N17	W36	.608	15403	14.9	58	-B	3	C		47		FDE	
ZURI	17	1352	1356	1408	N14	W35	.585	15403	15.0	16	-N		C	1356	160	2.0		
KANZ	17	1353	1356	1418	N14	W35	.585	15403	15.0	25	-B	2						
LOCA	17	1402E	1405	1425	N19	W30	.540	15403	15.3	23D	-N		V	1405	61	.8		

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX LON. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JUL																
GRP68284	17	1424+2	1427+3 1436	1447	N15	W35	.588	15403	15.0	23	-N				80	1.0	L
RAMY	17	1352	1427	1450	N17	W36	.608	15403	14.9	58	-N	3	C		106		FDE
KANZ	17	1424	1436	1449	N15	W34	.574	15403	15.1	25	-B	2					
MCMA	17	1425	1428	1500	N14	W37	.611	15403	14.8	35	-B		C	1428	80	1.1	EL
ZURI	17	1426	1430	1444	N14	W35	.585	15403	15.0	18	-N		C	1430	140	1.8	
WEND	17	1426		1443	N14	W33	.557	15403	15.1	22	-N		V				
HUAN	17	1428	1428	1439	N14	W35	.585	15403	15.0	11	-N	1	C	1428	60	.7	
TEHR	17	1435	1428U	1445	N17	W35	.595	15403	15.0	10	-B	2	C		63		
285 RAMY	17	1558	1600	1608	N19	E25	.475	15415	19.5	10	-N	3	C		20		Y5
GRP68286	17	1623+1	1625+3	1640	N17	E27	.489	15415	19.7	17	-N						H
MCMA	17	1623	1627	1640	N16	E27	.483	15415	19.7	17	-N		C	1627	50	.6	EH
RAMY	17	1623	1625	1645	N19	E25	.475	15415	19.6	22	-B	3	C		100		F
RAMY	17	1623	1628	1645	N19	E25	.475	15415	19.6	22	-F	3	C		167		F
KANZ	17	1624	1628	1638	N17	E27	.489	15415	19.7	14	-N	2					H
287 RAMY	17	1800	1802	1814	N18	E23	.442	15415	19.5	14	-B	3	C		66		F Y5
GRP68288	17	1835+5	1840+0	1850	N15	W11	.260	15410	16.9	15	-N				70	.7	
MCMA	17	1835	1840	1855	N17	W10	.274	15410	17.0	20	-N		C	1840	40	.4	E
RAMY	17	1839	1840	1851	N14	W11	.249	15410	17.0	12	-N	3	C		88		F
PALE	17	1839	1840	1849	N15	W12	.272	15410	16.9	10	-B	3	C		75		FDE
HUAN	17	1840		1845	N15	W11	.260	15410	17.0	5	-F	1	C				E
GRP68289	17	1949+2	1951+2	2007	N15	W12	.272	15410	16.9	18	-N				45	.5	
RAMY	17	1949	1951	2011	N14	W12	.262	15410	16.9	22	-B	3	C		69		F
MCMA	17	1950	1953	2005	N17	W10	.274	15410	17.1	15	-N		C	1953	50	.5	E
PALE	17	1951	1951	1957	N15	W13	.285	15410	16.9	6	-N	3	C		23		DE
HUAN	17	1952E		2009	N15	W12	.272	15410	16.9	17D	-F	1	P	1955	40	.4	
GRP68290	17	2028+7	2035+2	2055	N19	W37	.628	15403	15.1	27	-N				30	.4	
RAMY	17	2028	2035	2056D	N17	W40	.658	15403	14.9	28D	-B	3	C		45		F
MCMA	17	2028	2035	2110	N21	W31	.564	15403	15.5	42	-N		C	2035	40	.5	E
HUAN	17	2030		2052D	N20	W35	.608	15403	15.2	22D	-N	1	P	2034	25	.3	D
HUAN	17	2032		2040	N20	W36	.620	15403	15.2	8	-F	1	C	2037	20	.2	D
PALE	17	2035	2037	2057	N17	W39	.645	15403	14.9	22	-B	3	C		23		DE
GRP68291	17	2115+5	2120+3	2140	N15	W39	.640	15403	15.0	25	-N				40	.5	E
MCMA	17	2115	2123	2150	N14	W40	.650	15403	14.9	35	-B		C	2123	50	.7	E
PALE	17	2120	2120	2130	N17	W39	.645	15403	15.0	10	-N	3	C		32		DE
GRP68292	17	2133+0	2134+1	2206	N20	W40	.668	15403	14.9	33	-N				120	1.6	K
MCMA	17	2133	2135	2206D	N20	W38	.644	15403	15.0	33D	-B		C	2135	75	1.0	E
PALE	17	2133	2134	2223	N17	W40	.658	15403	14.9	50	-N	3	C		118		FDE
VORO	17	2133	2135	2158	N20	W49	.767	15403	14.2	25	1N		C	2135	152	2.4	K
GRP68293	17	2159+2	2202	2214	N16	W13	.295	15410	16.9	15	-N						
MCMA	17	2159		2206D	N17	W12	.295	15410	17.0	7D	-N		C	2206	80	.9	E
PALE	17	2201	2202	2214	N15	W14	.298	15410	16.9	13	-B	3	C		26		FDE
294 CULG	17	2234E	2240	2258D	N21	W37	.636	15403	15.2	24D	-B		P	2240	70	.9	Y5
GRP68295	18	0018+0	0020+4	0100	N21	W42	.694	15403	14.9	42	1N				190	2.7	
PALE	18	0018	0020	0111	N17	W42	.682	15403	14.9	53	-N	3	C		137		FDE
VORO	18	0018	0024	0049	N21	W48	.759	15403	14.4	31	1N		C	0024	251	3.9	
CULG	18	0042E		0046D	N22	W37	.640	15403	15.3	4D	-N		P	0043	60	.8	
296 ABST	18	0538E	0539	0545D	N14	W14	.287	15410	17.2	7D	-F		P	0539	61	.7	D Y5
297 BUCA	18	0800	0803	0812	N14	W44	.699	15403	15.0	12	-F		C	0803	15	.2	E Y5
298 BUCA	18	0820		0832	N19	W44	.710	15403	15.0	12	-F		C	0823	15	.2	Y5
GRP68299	18	0844+1	0855+3 0906	0923	N18	W44	.708	15403	15.1	39	-N				80	1.1	EHLU
HONT	18	0844	0857	0926D	N19	W43	.699	15403	15.1	42D	-N		C	0857	110		EH
HTPR	18	0845	0858	0920	N18	W43	.696	15403	15.1	35	-F		C	0858	60	.8	E
CATA	18	0845	0855	0925	N18	W44	.708	15403	15.1	40	-B	2	C	0855	84	1.2	
BUCA	18	0845		0923	N19	W44	.710	15403	15.1	38	-N		C	0900	63	.9	
KHAR	18	0858E	0858	0924D	N17	W44	.705	15403	15.1	26D	-N		P	0923	100	1.5	BCDL
TEHR	18	0903E	0906	0919	N18	W44	.708	15403	15.1	16D	1B	2	C		222		U

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE JUL	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg		
GRP68300	18	0925>9	0940 0947	1000	N15	W46	.724	15403	14.9	35	-N				35	.5	E	
HTPR	18	0925		0939D	N15	W44	.701	15403	15.1	14D	-F		C	0927	20	.3		
BUCA	18	0927		0957	N15	W46	.724	15403	14.9	30	-N		C	0929	47	.7	E	
CATA	18	0935	0940	0945D	N14	W46	.723	15403	14.9	10D	-N	2	P	0940	56	.6		
KHAR	18	0941E	0941	1000D	N15	W46	.724	15403	15.0	19D	-F		P	0942			BE	
MONT	18	0945E	0947	1012	N15	W46	.724	15403	15.0	27D	-N		C	0947	100		E	
301 KANZ	18	1226E	1229	1235	N18	W17	.364	15410	17.2	9D	-F	2						Y5
GRP68302	18	1306+1	1310+6	1322	N19	W46	.733	15403	15.1	16	-B				50	.7	EU	
MCMA	18	1306		1309D	N20	W46	.735	15403	15.1	3D	-B		C	1308	50	.8	E	
HTPR	18	1307	1310	1320	N18	W45	.719	15403	15.2	13	-F		C	1310	50	.7	E	
KANZ	18	1308E	1313	1320	N20	W45	.724	15403	15.2	12D	-B	2						
RAMY	18	1311E	1313	1324	N17	W49	.761	15403	14.9	13D	-B	3	C		33		FDE	
TEHR	18	1314E	1316	1324	N18	W46	.730	15403	15.1	10D	-B	2	C		95		U	
303 HTPR	18	1313	1330	1340	N17	W16	.342	15410	17.4	27	-F		C	1330	20	.2	E	Y5
GRP68304	18	1419+2	1428+4	1450	N18	W20	.402	15410	17.1	31	-N							
KANZ	18	1419	1432	1453	N19	W18	.386	15410	17.2	34	-N	2						
HUAN	18	1421E	1430	1447	N19	W18	.386	15410	17.2	26D	-N	1	P	1430	30	.3		
RAMY	18	1421	1425	1451	N14	W22	.401	15410	16.9	30	1B	3	C		241		FDE	
TEHR	18	1430E	1432	1445	N15	W22	.407	15410	17.0	15D	1B	2	C		254		F	
MCMA	18	1432E		1455	N19	W19	.398	15410	17.2	23D	-N		C	1432	100	1.1	E	
305 KANZ	18	1532		1533D	N19	W18	.386	15410	17.3	1D	-N	2						Y5
GRP68306	18	1533+2	1538	1552D	N19	W48	.754	15403	15.0	19	-B							
KANZ	18	1533		1533D	N21	W46	.738	15403	15.2		-F	1						
RAMY	18	1535	1538	1552D	N17	W51	.782	15403	14.8	17D	-B	3	C		34		FDE	
307 RAMY	18	1534	1534	1543	N19	E12	.318	15415	19.5	9	-N	3	C		55		FDE	Y5
GRP68308	18	1719+3	1724+2	1858	N17	W51	.782	15403	14.9	99	-N				110	1.8	Z	
RAMY	18	1719	1724	1737D	N17	W51	.782	15403	14.9	18D	-N	3	C		95		Z F	
PALE	18	1722	1726	1851	N17	W51	.782	15403	14.9	89	-N	3	C		118		FDE	
HUAN	18	1835E		1904D	N22	W48	.761	15403	15.2	29D	-F	1	P	1835	35	.5		
GRP68309	18	1927	1953+6	2010D	N17	W52	.792	15403	14.9	43	2B				450	7.5		
PALE	18	1927	1959	2010D	N17	W53	.802	15403	14.8	43D	2B	3	C		520			
RAMY	18	1945E	1957	2000D	N17	W52	.792	15403	14.9	12D	2B	3	V		388		FDE	
RAMY	18	1948E	1953	2000D	N17	W52	.792	15403	14.9	12D	1B	3	V		352		FDE	
	18	2042	2051	NO FLARE PATROL														
	18	2059	2100	NO FLARE PATROL														
	18	2240	2244	NO FLARE PATROL														
310 VORO	19	0141	0142	0144	S21	W11	.467	15413	18.2	3	-F		C	0142	27	.3	D	Y5
311 VORO	19	0149	0149	0151	S21	W11	.467	15413	18.3	2	-F		C	0149	36	.4	D	Y5
GRP68312	19	0324	0326+0	0331	N19	00	.247	15415	19.1	7	-N				100	1.0	U	
PALE	19	0324	0326	0332	N20	E02	.266	15415	19.3	8	-B	3	C		110		FDE	
TEHR	19	0325E	0326	0330	N19	W01	.248	15415	19.1	5D	-N	3	C		95		U	
GRP68313	19	0510E	0515+3	0535	N20	W63	.891	15403	14.5	25	1N				120	2.7	E	
CULG	19	0510E	0516	0600	N23	W63	.894	15403	14.5	50D	1N		C	0516	110	2.2		
HITK	19	0513E	0515	0526D	N18	W63	.890	15403	14.5	13D	1N		C	0515	100	2.1	E	
TACH	19	0514E		0526	N22	W65	.907	15403	14.3	12D	1N		C	0514	172	4.0	E	
TEHR	19	0515E	0518	0535	N17	W56	.831	15403	15.0	20D	-B	2	C		95		DE	
314 CULG	19	0555	0611	0636D	S28	W68	.957	15401	14.1	41D	-F		C	0611	40		S	Y5
315 ABST	19	0709E	0713	0715D	N16	W63	.889	15403	14.6	6D	-F		P	0713	44	.9	D	Y5
GRP68316	19	0944+1	0946+0	0953	N12	W32	.537	15410	17.0	9	-F				80	1.0	E	
HTPR	19	0944	0946	0953	N13	W34	.567	15410	16.9	9	-F		C	0946	90	1.1	E	
MONT	19	0945	0946	0951	N12	W32	.537	15410	17.0	6	-F		C	0946	80			
BUCA	19	0945		1005	N10	W30	.503	15410	17.2	20	-F		C	0946	71	.8		
317 ABST	19	1049E	1052	1100	S22	W18	.530	15413	18.1	11D	-F		P	1052	44	.4	D	Y5
318 HTPR	19	1204	1206	1220	N19	W08	.281	15415	18.9	16	-F		C	120E	30	.3	E	Y5
319 RAMY	19	1221	1222	1236	N18	W01	.231	15415	19.4	15	-N	3	C		20		F	Y5

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mil. of Disk	CORR AREA Sq. Deg.		
	JUL																	
GRP68320	19	1321+0	1322+5	1400	N16	W60	.865	15403	15.1	39	-N				60	1.2	E	
HTPR	19	1321	1323	1345	N16	W60	.865	15403	15.1	24	-F		C	1323	40	.8	E	
KANZ	19	1321	1327	1400	N17	W60	.866	15403	15.1	39	-F	2					EF	
RAMY	19	1321	1322	1405	N15	W63	.849	15403	14.8	44	-N	3	C		61		F	
TEHR	19	1323E	1327	1342D	N18	W60	.866	15403	15.1	19D	-B	2	C		127		DE	
321 RAMY	19	1337	1340	1405	N18	W05	.245	15415	19.2	28	-N	3	C		55		F	Y5
322 RAMY	19	1428	1429	1436	N18	W05	.245	15415	19.2	8	-N	3	C		45		F	Y5
323 RAMY	19	1540	1541	1547	N18	W06	.251	15415	19.2	7	-N	3	C		36		F	Y5
324 HUAN	19	2050		2056	N15	W70	.937	15403	14.6	6	-F	1	C					Y5
	19	2112	2143	NO FLARE PATROL														
GRP68325	20	0002+7	0012+4	0057	N17	W70	.937	15403	14.8	55	1N				90		H	
CULG	20	0002	0015	0140	N20	W71	.943	15403	14.7	98	1N		C	0015	100		T	
MITK	20	0006E	0016	0057D	N17	W71	.942	15403	14.7	51D	1N		C	0016	190		EH	
PALE	20	0009	0012	0042	N17	W68	.924	15403	14.9	33	-N	3	C		38		FDE	
MANI	20	0011E	0014	0019D	N17	W70	.937	15403	14.8	8D	-N		V		90	1.9	F	
	20	0148	0152	NO FLARE PATROL														
326 CULG	20	0230	0240	0306	S27	W21	.612	15413	18.5	36	-N		C	0240	70	.9	F	Y5
GRP68327	20	0307	0320 0333	0345	S23	W24	.593	15413	18.3	38	1N				240	2.9	F	
CULG	20	0307	0320	0425	S24	W24	.603	15413	18.3	78	-N		C	0320	120	1.5	F	
TEHR	20	0329E	0333	0344	S16	W24	.523	15413	18.3	15D	1B	2	C		222		F	
TACH	20	0333E		0345D	S23	W24	.593	15413	18.3	12D	1F		V	0333	265	3.4	E	
328 CULG	20	0421	0431	0442	N23	W76	.967	15403	14.5	21	-F		C	0431	40		T	Y5
329 ABST	20	0506E	0526	0535	N23	W75	.963	15403	14.6	29D	-F		P	0526	52		D	Y5
330 CULG	20	0513	0528	0540	S26	W80	.993	15401	14.2	27	-N		C	0528	30			Y5
331 ABST	20	0536E	0549	0559D	N19	W79	.978	15403	14.3	23D	-F		P	0549	70		DK	Y5
332 ABST	20	0558E	0559	0601D	N13	W44	.697	15410	16.9	3D	-F		P	0559	52	.7	D	Y5
333 ABST	20	0605E	0605	0609D	N19	W07	.272	15415	19.7	4D	-F		P	0605	52	.6	D	Y5
334 CULG	20	0630	0637	0652	N24	W75	.963	15403	14.6	22	-N		C	0637	40		T	Y5
GRP68335	20	0707>9	0718+4	0726	N17	W17	.353	15415	19.0	19	-F				90	1.0		
ABST	20	0707E	0718	0722D	N16	W19	.371	15415	18.9	15D	-F		P	0718	70	.8	D	
ABST	20	0721	0722	0726	N19-	W16	.360	15415	19.1	5	-F		C	0722	110	1.2	E	
GRP68336	20	0737+2	0741+1	0748	N21	W76	.967	15403	14.6	11	-N				50		E	
MONT	20	0737	0742	0748	N21	W76	.967	15403	14.6	11	-F		C	0742	50		E	
KANZ	20	0735E	0742	0750	N22	W74	.958	15403	14.8	12D	-B	1						
HTPR	20	0739	0741	0746	N21	W77	.971	15403	14.5	7	-N		C	0741	60		E	
337 ABST	20	0812E	0817	0838D	N18	W09	.274	15415	19.7	26D	-F		P	0817	61	.7	DK	Y5
338 HTPR	20	0903	0905	0907	N21	W79	.978	15403	14.5	4	-F		C	0905	20			Y5
339 CATA	20	1015E	1015	1020	N10	W43	.681	15410	17.2	5D	-N	2	P	1015	28	.3		Y5
340 HTPR	20	1146	1148	1200	S17	E23	.522	15423	22.2	14	-F		C	1148	20	.2	E	Y5
GRP68341	20	1200+6	1209 1221+0	1313	N21	W78	.975	15403	14.6	73	-N				25		D	
RAMY	20	1200	1221	1312	N18	W75	.963	15403	14.9	72	-B	3	C		22			
RAMY	20	1200	1209	1312	N18	W75	.963	15403	14.9	72	-N	3	C		14			
HTPR	20	1206	1221	1313	N21	W80	.982	15403	14.5	67	-N		C	1221	30			
HCMA	20	1215E	1221	1315	N22	W80	.981	15403	14.5	60D	-N		C	1221			D	
ZURI	20	1223E	1231	1247	N21	W79	.978	15403	14.6	24D	1N		P	1231	60			
TEHR	20	1308E	1311	1315	N21	W73	.953	15403	15.1	7D	-B	2	C		64			

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
GRP68342	20	1304+2	1307+4	1315	N18	W46	.729	15410	17.1	11	-N				90	1.3	K	
MCMA	20	1304	1308	1318	N18	W46	.729	15410	17.1	14	-B		C	1308	70	1.0	E	
HTPR	20	1305	1308	1315	N18	W46	.729	15410	17.1	10	-B		C	1308	130	1.8	K	
ZURI	20	1305E	1309	1315	N18	W45	.718	15410	17.2	10D	1B		P	1309	160	2.4		
RAMY	20	1306	1307	1316	N16	W47	.737	15410	17.0	10	-N	3	C		67		F	
KIEV	20	1307E	1309	1315D	N18	W46	.729	15410	17.1	8D	-F		C	1309	100	1.5	D	
TEHR	20	1308E	1311	1314	N18	W47	.740	15410	17.0	6D	-B	2	C		64		F	
GRP68343	20	1321+1	1323+1	1337	N21	W78	.975	15403	14.7	16	-N				60			
MCMA	20	1321	1324	1345	N22	W80	.981	15403	14.6	24	-B		C	1324			D	
RAMY	20	1321	1324	1341	N18	W75	.963	15403	14.9	20	-N	3	C		49		F	
ZURI	20	1321	1323	1335D	N21	W79	.978	15403	14.6	14D	1B		P	1323	80			
HTPR	20	1321	1324	1331	N21	W80	.982	15403	14.6	10	-N		C	1324	60			
TEHR	20	1322	1324	1335	N21	W73	.953	15403	15.1	13	-N	2	C		64			
GRP68344	20	1431+2	1435+0	1440	N21	W80	.982	15403	14.6	9	-F						D	
ZURI	20	1431	1435	1439	N21	W80	.982	15403	14.6	8	-F		C	1435	100			
MCMA	20	1433	1435	1441	N22	W81	.984	15403	14.5	8	-F		C	1435			D	
GRP68345	20	1505+8	1514 1529	1540	N21	W83	.990	15403	14.4	35	-N						E	
KANZ	20	1505	1525	1541	N22	W83	.990	15403	14.4	36	-N	2						
MCMA	20	1510E	1514	1535D	N21	W83	.990	15403	14.4	25D	-N		C	1514			E	
ZURI	20	1513	1539	1539	N21	W80	.982	15403	14.6	26	-F		P	1539	50			
GRP68346	20	1557+9	1608+2	1616	N21	W83	.990	15403	14.4	19	-B				35		D	
KANZ	20	1557	1609	1616D	N22	W83	.990	15403	14.4	19D	-B	2						
HTPR	20	1605	1608	1615	N21	W85	.994	15403	14.3	10	-N		C	1608	25		D	
RAMY	20	1606	1610	1617	N18	W76	.967	15403	15.0	11	-B	3	C		42			
MCMA	20	1607E	1608	1616	N22	W83	.990	15403	14.4	9D	-B		C	1608			D	
347 HTPR	20	1642	1706	1718	N18	W22	.426	15415	19.0	36	-F		C	1706	10	.1	DK	Y5
GRP68348	20	1702	1711+1	1725	N17	W48	.749	15410	17.1	23	-F				30	.5	D	
HTPR	20	1702	1711	1725	N17	W48	.749	15410	17.1	23	-N		C	1711	30	.4	D	
MCMA	20	1705E	1712	1718D	N18	W48	.751	15410	17.1	13D	-F		C	1712	25	.4	D	
349 CULG	20	2209	2231U	2310	N22	W82	.987	15403	14.8	61	1F		C	2231	70		FJ	Y5
350 TACH	21	0413E		0429D	N18	W88	.998	15403	14.6	16D	2F		V	0413	265		D	Y5
GRP68351	21	0451E	0453+0	0510	N18	W85	.994	15403	14.8	19	-N				45		D	
TEHR	21	0451E	0453	0510	N17	W83	.990	15403	15.0	19D	-N	2	C		64		DE	
TACH	21	0452E	0453	0456D	N20	W88	.998	15403	14.6	4D	-N		C	0453	33		D	
352 ABST	21	0507E	0507	0513	N21	W27	.512	15415	19.2	6D	-F		P	0507	61	.7	D	Y5
GRP68353	21	0602+2	0608+2	0617	N21	W90	1.000	15403	14.5	15	1N				80		D	
TACH	21	0602	0608	0617D	N22	W89	.999	15403	14.6	15D	1B		C	0608	101		D	
HTPR	21	0604	0609	0617	N21	W90	1.000	15403	14.5	13	-F		C	0609	30			
CATA	21	0605E	0610	0615D	N20	W90	1.000	15403	14.5	10D	1N	2	P	0610	84			
354 ABST	21	0624E	0636	0639D	N18	W32	.558	15415	18.9	15D	-F		P	0636	79	1.0	DJ	Y5
355 ABST	21	0707E	0716	0717D	S16	E10	.392	15423	22.0	10D	-F		P	0716	70	.8	F	Y5
356 KHAR	21	0727E	0736	0739D	S33	W37	.825	15430	18.5	12D	-F		P				D	Y5
GRP68357	21	0736	0749	0853D	N24	W90	.999	15403	14.6	77	?F						EH	
KHAR	21	0736		0828D	N22	W90	.999	15403	14.6	52D	F		P	0756			EHT	
	IMP	1 NO	HTPR2	MITK2	CATA1	ABST1												
KHAR	21	0738E	0749	0853D	N27	W90	.999	15403	14.6	75D	1F		P	0749			DH	
GRP68358	21	0739+6	0743+2	0751	N15	W90	1.000	15403	14.6	12	-N				25		DH	
KHAR	21	0739E	0743	0752D	N15	W88	.998	15403	14.7	13D	-N		P	0743			DH	
CATA	21	0740	0745	0750	N12	W90	1.000	15403	14.6	10	-N	2	C	0745	28			
MITK	21	0745		0747D	N15	W90	1.000	15403	14.6	2D	-N		C	0746		.2		
359 KHAR	21	0838E		0845D	N19	W33	.576	15415	18.9	7D	-F		P	0838			D	Y5
360 KHAR	21	0838E	0841	0848D	N12	W60	.863	15410	16.9	10D	-F	*	P	0841	90	1.8	D	Y5
GRP68361	21	0909>9	0932 1014	1030D	N21	W89	.999	15403	14.7	81	-N						EK	
KHAR	21	0909E	0932	1045D	N23	W90	.999	15403	14.6	96D	1N		P	1023			EKT	
HTPR	21	1005	1014	1030	N21	W90	1.000	15403	14.7	25	-F		C			.2		
KHAR	21	1040E	1047	1102D	N19	W88	.998	15403	14.8	22D	-F		P	1046			DT	

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE JUL	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
362 KHAR	21	1055E	1055	1115D	N12	W60	.863	15410	17.0	20D	-F		P					Y5
GRP68363	21	1111>9	1124+2	1140	N22	W90	.999	15403	14.7	29	1N						EK	
KHAR	21	1111E	1126	1201D	N22	W90	.999	15403	14.7	50D	1N	*	P				EKT	
CATA	21	1120	1125	1140	N21	W90	1.000	15403	14.7	20	1N	*	C	1125	84			
RAMY	21	1123	1124	1128	N27	W88	.998	15403	14.9	5	-N	*	C		20			
GRP68364	21	1118>9	1203	1248	N13	W60	.863	15410	17.0	90	-N						E	
KHAR	21	1118E		1201D	N12	W59	.854	15410	17.0	43D	1F		P	1147	100	2.1	E	
RAMY	21	1200	1203	1248	N14	W61	.872	15410	16.9	48	-N	3	C		28			
365 RAMY	21	1237	1237	1249	N17	W89	.999	15403	14.9	12	-N	3	C		7			Y5
366 RAMY	21	1307	1307	1354	N14	W61	.872	15410	17.0	47	-N	3	C		22			Y5
GRP68367	21	1506+1	1507+1	1513	N17	W63	.889	15410	16.9	7	-F				25	.6	D	
HTPR	21	1506	1508	1512	N20	W65	.905	15410	16.8	6	-F		C	1509	20	1.4	D	
RAMY	21	1507	1507	1513	N14	W62	.880	15410	17.0	6	-N	3	C		29			
368 RAMY	21	1717	1717	1720	N11	W64	.896	15410	16.9	3	-N	3	C		16			Y5
369 RAMY	21	1843	1845	1856	N11	W65	.903	15410	16.9	13	-B	3	C		33			Y5
370 RAMY	21	1857	1900	1926C	N17	W90	1.000	15403	15.0	29D	1B	3	C					Y5
	21	2120	2140	NO FLARE PATROL														
	21	2155	2203	NO FLARE PATROL														
	21	0149	0219	NO FLARE PATROL														
	21	0040	0110	NO FLARE PATROL														
	21	0006	0030	NO FLARE PATROL														
371 CULG	21	2212	2217	2254	N13	W68	.924	15410	16.8	42	-F		C	2217	60		T	Y5
372 CULG	21	2250	2254	2315	N19	W40	.662	15415	19.0	25	-F		C	2254	30	.4		Y5
373 CULG	21	2340	2352	0025	S24	W02	.484		21.8	45	-N		C	2352	30	.3		Y5
374 CULG	22	0501	0506	0520	S21	E41	.741	15429	25.3	19	-F		C	0506	60	.9		Y5
375 CULG	22	0515	0515	0528	N22	W11	.344		21.4	13	-F		C	0515	20	.2		Y5
376 HTPR	22	0527	0538	0545	N18	E45	.717	15428	25.6	18	-N		C	0538	70	1.0	D	Y5
GRP68377	22	0611+4	0625+2	0654	S20	E40	.726	15429	25.3	43	-F						D	
CULG	22	0611	0625	0653	S21	E39	.722	15429	25.2	42	-F		C	0625	40	.6		
HTPR	22	0615	0627	0655	S20	E41	.736	15429	25.3	40	-F		C	0627	10	.2	D	
378 ABST	22	0618E	0621	0630D	N27	E58	.860	15428	26.6	12D	-F		P	0621	61	.7	DG	Y5
GRP68379	22	0659E	0734+3	0759D	N19	E43	.697	15428	25.5	60	-F						HK	
ABST	22	0659E	0734	0757D	N19	E44	.708	15428	25.6	58D	1F		P	0734	148	2.1	FK	
KHAR	22	0705E	0737	0759D	N19	E42	.685	15428	25.4	54D	-F		P	0723	120	1.7	DHT	
380 KHAR	22	0717E		0750D	N28	E56	.846	15428	26.5	33D	-F		P	0723	90	1.8	D	Y5
GRP68381	22	0835+1	0835+3	0845	N12	W39	.632	15415	19.4	10	-F				50	.6	AD	
KHAR	22	0835E	0836	0849D	N12	W41	.658	15415	19.3	14D	-F		P	0843	110	1.5	D	
CATA	22	0835	0835	0845	N12	W39	.632	15415	19.4	10	-N	2	C	0835	45	.5		
MEUD	22	0836	0838	0842	N13	W39	.633	15415	19.4	6	-F		C					
HTPR	22	0836	0838	0844	N13	W38	.620	15415	19.5	8	-F		C	0838	40	.5	A	
382 ABST	22	0852E	0859	0900D	S17	W03	.377	15423	22.1	8D	-F		P	0859	50	.6	DG	Y5
383 KHAR	22	0854E	0858	0908D	N19	E42	.685	15428	25.5	14D	-F		P	0858	110	1.6	DT	Y5
GRP68384	22	1004+3	1014+2	1036	S19	E38	.700	15429	25.3	32	-F						EH	
KHAR	22	1004E	1014	1037D	S19	E38	.700	15429	25.3	33D	-F		P	1014	110	1.7	EH	
HTPR	22	1007	1016	1035	S20	E39	.716	15429	25.3	28	-F		C	1016	20	.3	E	
385 KHAR	22	1022	1026	1035D	N27	E37	.663	15428	25.2	13D	-F		P	102E			DH	Y5
GRP68386	22	1738+4	1747+0	1759	S15	W08	.366	15423	22.1	21	-F				45	.5	E	
HTPR	22	1738	1747	1800	S15	W09	.372	15423	22.1	22	-F		C	1747	40	.4	E	
HCMA	22	1742	1747	1758	S15	W08	.366	15423	22.1	16	-N		C	1747	45	.5	E	
387 HCMA	22	1941E		1951D	N27	E33	.621	15428	25.3	10D	-N		C	1942	30	.4	E	Y5

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
	22	1951	2015	NO FLARE PATROL														
	22	2016	2144	NO FLARE PATROL														
388 VORO	23	0033	0035	0039	S16	W14	.426	15423	22.0	6	-F		C	0035	54	.6	DH	Y5
389 VORO	23	0211	0212	0215	S16	W14	.426	15423	22.0	4	-F		C	0212	45	.5	E	Y5
390 VORO	23	0221	0222	0229	S16	W14	.426	15423	22.0	8	-F		C	0222	45	.5	E	Y5
GRP68391	23	0238+4	0245	0249D	S20	W68	.947	15413	18.0	11	-N				70		GHJ	
CULG	23	0238	0251	0328D	S20	W69	.952	15413	17.9	50D	1N		C	0251	90		FG	
VORO	23	0242	0245	0249	S21	W68	.948	15413	18.0	7	-N		C	0245	63		DHJ	
392 ABST	23	0502	0600	0614D	N17	E24	.444	15428	25.0	72D	-F		P	0600	87	1.0	FK	Y5
393 ABST	23	0504	0606	0614D	N12	W51	.775	15415	19.4	70D	-F		P	0606	131	2.0	FJK	Y5
394 ABST	23	0700E	0709	0826D	N17	E24	.444	15428	25.1	86D	-F		P	0709	87	1.0	FK	Y5
395 KANZ	23	0820	0824	0848	N13	W52	.787	15415	19.4	28	-F	1						Y5
396 ABST	23	0916E	0916	0937D	S17	W18	.474	15423	22.0	21D	-F		P	0916	61	.7	EGJ	Y5
GRP68397	23	1448+0	1454	1528	N18	W60	.866	15415	19.1	40	-B						S	
MEUD	23	1448		1530	N20	W59	.859	15415	19.2	42	1N		C	1500	150	3.0	E	
RAMY	23	1448	1454	1525	N17	W61	.873	15415	19.0	37	-3	3	C		55		F S	
	23	1640	2145	NO FLARE PATROL														
	23	2151	2156	NO FLARE PATROL														
398 ZURI	24	0758	0802	0808	S24	W24	.607		22.5	10	-F		C	0802	100	1.3		Y5
399 ZURI	24	1304	1306	1316	S22	E11	.488	15429	25.4	12	-F		C	1306	50	.6		Y5
400 KANZ	24	1312		1320D	N22	E90	.999	15440	31.3	8D	-F	1						Y5
401 KANZ	24	1357		1401	N22	E90	.999	15440	31.3	4	-F	1						Y5
GRP68402	24	1410+2	1418	1434	S24	E80	.993	15436	30.6	24	-F						E	
KANZ	24	1410		1417D	S24	E81	.994	15436	30.7	7D	-F	1						
ZURI	24	1412	1418	1434	S23	E79	.990	15436	30.5	22	1F		C	1418	60			
MCMA	24	1413		1420D	S25	E80	.993	15436	30.6	7D	-F		C				E	
	24	1631	1633	NO FLARE PATROL														
	24	2100	2125	NO FLARE PATROL														
	24	2202	2215	NO FLARE PATROL														
403 CULG	25	0042	0045	0053	S21	W67	.944	15416	20.0	11	-F		C	0045	20			Y5
404 CULG	25	0140	0144	0202	N25	E12	.389	15428	26.0	22	-F		C	0144	50	.6		Y5
405 HTPR	25	0608	0610	0612	N27	E17	.456	15428	26.5	4	-F		C	0610	40	.5	D	Y5
406 ZURI	25	0802E	0802	0822	S22	W70	.959	15416	20.1	20D	?F		P	0802	80			Y5
	IMP 1 NO 1 MONT2 CATA1																	
407 ZURI	25	1000	1006	1014	S22	W71	.964	15416	20.1	14	-F		C	1006	50			Y5
GRP68408	25	1350+9	1400+2	1406	S24	W72	.970	15416	20.2	16	-F				60			
ZURI	25	1350	1402	1406	S22	W73	.972	15416	20.1	16	-F		C	1402	60			
CATA	25	1355	1400	1400D	S24	W72	.970	15416	20.2	5D	-N	2	P	1400	56			
RAMY	25	1359	1400	1405	S25	W71	.967	15416	20.3	6	-F	3	C		23			
GRP68409	25	2142+0	2144+6	2201	S19	W83	.996	15416	19.7	19	1F				120		H	
VORO	25	2142	2144	2158	S21	W85	.999	15416	19.5	16	1F		C	2144	90		H	
CULG	25	2142E	2150	2203	S18	W82	.995	15416	19.8	21D	1N		C	2150	160			
410 VORO	25	2300	2302	2306	S22	W88	1.000	15416	19.4	6	-N		C	2302	27		D	Y5
411 CULG	26	0056	0102	0108	S16	W67	.937	15421	21.0	12	-N		C	0102	20	.6		Y5
412 CULG	26	0512	0518	0527	N18	W10	.276	15428	25.5	15	-F		C	0518	30	.3		Y5
413 ISTA	26	0813E		0821D	N10	W15	.269		25.2	8D	-F							Y5
414 KANZ	26	1150	1153	1201	N37	E90	.998	15441	2.2	11	-B	2						Y5

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
415 KANZ	26	1446		1512	N37	E90	.998	15441	2.4	26	-F	2						Y5
	26	1855	1922	NO FLARE PATROL														
416 RAMY	26	1942E	1944	1949	N39	E90	.998	15441	2.6	7D	-F	3	C					Y5
417 HTPR	27	0549	0555	0605	S21	W33	.666	15429	24.8	16	-F		C	0555	100	1.4	E	Y5
418 KHAR	27	0815E		0853	N36	E88	.997	15441	2.9	38D	-N		P	0838			DHT	Y5
419 KHAR	27	0933E	0933	0941D	N36	E88	.997	15441	3.0	8D	-F		P	0933			DHT	Y5
420 KANZ	27	1016	1019	1024	N36	E88	.997	15441	3.0	8	-F	*					T	Y5
421 KHAR	27	1016E		1035D	N11	E36	.588	15434	30.1	19D	-F		V	1034			D	Y5
422 KANZ	27	1019	1024	1040	N20	E51	.784	15440	31.3	21	-F	2						Y5
423 KHAR	27	1030E		1045D	N36	E88	.997	15441	3.0	15D	-F		P	1039			DHT	Y5
424 KANZ	27	1059		1108	N20	E90	.999	15443	3.2	9	-F	2					T	Y5
425 RAMY	27	1428	1432	1456	N37	E83	.988	15441	2.8	28	-F	3	C					Y5
426 RAMY	27	1543	1545	1552	N37	E82	.986	15441	2.8	9	-N	3	C					Y5
427 MCMA	27	1820E		1847	N36	E86	.994	15441	3.2	27D	-F		C	1820			D	Y5
	27	2212	2302	NO FLARE PATROL														
	27	0149	0157	NO FLARE PATROL														
	28	0140	0200	NO FLARE PATROL														
428 ABST	28	0754	0757	0800	N12	E79	.979	15445	3.3	6	?F		P	0757	87		EJ	Y5
	IMP.1 NO		MITK2	HTPR2	MONT2	ZURI2	CATA1 L											
429 KANZ	28	1045	1049	1107	N17	E58	.847	15444	1.8	22	-F	2						Y5
GRP68430	28	1410+1	1413+1	1421	N27	W26	.542	15428	26.6	11	-F						DH	
KANZ	28	1410	1413	1421	N27	W26	.542	15428	26.6	11	-F	2						
MCMA	28	1411	1414	1420	N27	W27	.553	15428	26.6	9	-F		C	1414	25	.3	DH	
431 KANZ	28	1425	1425	1429	N22	E89	.999	15443	4.3	4	-B	2					D	Y5
432 CULG	28	2150	2155	2201	N38	W88	.996	15442	22.3	11	-F		C	2155	40			Y5
GRP68433	29	0134	0141 0242	0244	N27	W31	.595	15428	26.7	7D	-F						U	
CULG	29	0134	0242	0244	N28	W30	.591	15428	26.8	7D	-N		C	0242	90	1.1	U	
MITK	29	0135E	0141	0158D	N27	W32	.605	15428	26.7	23D	-F		C	0141				
434 CULG	29	0558	0600	0611	N15	E64	.895	15443	3.0	13	-F		C	0600	20	.5		Y5
435 KHAR	29	0825E		0845D	N36	E61	.894	15441	2.9	20D	-F		P	0843	60	1.4	E	Y5
436 KHAR	29	0843E		0845D	S21	E75	.979	15446	4.0	2D	-F		P	0843	50		DT	Y5
437 KHAR	29	0907E	0907	0917D	S21	E75	.979	15446	4.0	10D	-F		P				DT	Y5
438 KHAR	29	0930E	0934	0947D	S22	E74	.976	15446	3.9	17D	-F		P				DT	Y5
GRP68439	29	0957+7	1003>9	1033	N27	W36	.648	15428	26.7	36	-F				70	.9	EJ	
KHAR	29	0957E	1013	1043D	N27	W38	.670	15428	26.6	46D	-F		P	1013	110	1.5	E	
HTPR	29	0959	1005	1040	N26	W36	.643	15428	26.7	41	-F		C	1005	30	.4	E	
ABST	29	1000	1003	1030	N26	W36	.643	15428	26.7	30	-F		C	1003	87	1.2	DJ	
ZURI	29	1000	1010	1028	N27	W36	.648	15428	26.7	28	-F		C	1010	60	.8		
KANZ	29	1004	1008	1016	N27	W36	.648	15428	26.7	12	-N	2						
440 ABST	29	1026	1031	1040	N36	E64	.912	15441	3.2	14	-F		C	1031	87	1.9	D	Y5
GRP68441	29	1026>9	1049+5	1116	N22	E72	.947	15443	3.8	50	1N							
KHAR	29	1008E	1050	1220D	N23	E73	.952	15443	3.9	132D	2N	*	P	1049	490		CE	
HTPR	29	1026	1052	1135	N22	E75	.961	15443	4.1	69	-F	*	C	1052	90		E	
ABST	29	1028	1054	1116	N24	E75	.962	15443	4.1	48	2N	*	C	1054	262		F	
ZURI	29	1038	1050	1050D	N22	E70	.936	15443	3.7	12D	2N	*	P	1050	240			
KANZ	29	1039	1051	1105D	N22	E69	.930	15443	3.6	26D	-N	*					F	
TEHR	29	1045E	1049	1102	N19	E65	.903	15443	3.3	17D	-B	*	C		127		DE	
WEND	29	1047E		1108D	N22	E71	.942	15443	3.8	21D	2N	*	P		300		F	

Hα SOLAR FLARES

JULY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	JUL																	
442 KHAR	29	1116E		1220D	S22	E73	.972	15446	3.9	64D	?F		P				CET	Y5
	IMP.1	NO	HTPR2	KANZ1														
443 RAMY	29	1832	1836	1842	N23	E68	.925	15443	3.9	10	-N	3	C		67		F	Y5
444 CULG	29	2355	2400	0020	N33	E54	.840	15441	3.0	25	-F		C	2400	20	.4		Y5
445 CULG	30	0205	0216	0237	N28	W45	.745	15428	26.7	32	-F		C	0216	50	.8		Y5
446 CULG	30	0610	0613	0617	S22	E58	.892	15446	3.6	7	-F		C	0613	20	.4	T	Y5
447 ABST	30	0658	0708	0720	S21	E61	.910	15446	3.9	22	-F		C	0708	87	2.0	EJ	Y5
GRP68448	30	0804+1	0804+1	0815D	S19	E58	.884	15446	3.7	11	-F						E	
KHAR	30	0804E	0804	0810D	S21	E60	.903	15446	3.8	6D	-F		P				ET	
CATA	30	0805	0805	0815D	S18	E56	.867	15446	3.5	10D	-N	2	C	0805	28	.5		
449 KHAR	30	0940E		0953D	S21	E60	.903	15446	3.9	13D	?F		P	0945	100	2.2	EHT	Y5
	IMP.1	NO	HTPR2	CATA1	KANZ1													
GRP68450	30	0954	0957	1005D	S21	E56	.875	15446	3.6	11	-N						EH	
KANZ	30	0954	0957	1005	S20	E53	.848	15446	3.4	11	-N	2						
KHAR	30	1003E	1012	1036D	S22	E60	.905	15446	3.9	33D	-F		P	1006			BEHT	
GRP68451	30	1034+0	1037+4	1055	N36	E50	.818	15441	3.2	21	-F						EJ	
ABST	30	1034	1037	1055	N36	E50	.818	15441	3.2	21	-N		C	1037	87	1.5	DJ	
HTPR	30	1034	1039	1055	N36	E50	.818	15441	3.2	21	-F		C	1039	20	.3	E	
KHAR	30	1035E	1041	1102D	N37	E51	.829	15441	3.3	27D	-F		P	1036			E	
452 KHAR	30	1105E	1107	1111D	S22	E60	.905	15446	4.0	6D	-F		V	1107			ET	Y5
453 KHAR	30	1142E	1144	1155D	N38	E51	.833	15441	3.3	13D	-F		P				D	Y5
454 KHAR	30	1145E	1147	1153D	S22	E60	.905	15446	4.0	8D	-F		P	1147	88	2.0	EDT	Y5
GRP68455	30	1158+1	1202+0	1214	N36	E49	.810	15441	3.2	16	-F				40	.7	D	
KANZ	30	1158	1202	1212	N35	E48	.799	15441	3.1	14	-F	2						
HTPR	30	1158	1202	1215	N36	E50	.818	15441	3.2	17	-F		C	1202	20	.3	D	
RAMY	30	1159	1202	1211	N37	E46	.792	15441	2.9	12	-N	2	C		43			
KHAR	30	1203E	1203	1218D	N38	E51	.833	15441	3.3	15D	-N		P	1203	55	1.3	D	
456 KHAR	30	1203E		1221D	S22	E60	.905	15446	4.0	18D	-F		P				ET	Y5
457 RAMY	30	1559	1559	1605	S20	E52	.840	15446	3.6	6	-N	3	C		19			Y5
458 RAMY	30	1633	1634	1657	S21	E50	.827	15446	3.4	24	-N	3	C		23		F	Y5
459 CULG	31	0355	0359	0403	S23	E45	.793	15446	3.5	8	-F		C	0359	30	.5	T	Y5
460 CULG	31	0547	0555	0612	S24	E45	.798	15446	3.6	25	-F		C	0555	30	.5	T	Y5
461 CULG	31	0557	0604	0615	N20	E50	.773	15443	4.0	18	-F		C	0604	20	.3		Y5
GRP68462	31	0755E	0812+4	0826	N17	E33	.562	15443	2.8	31	-F						D	
KHAR	31	0755E	0816	0829D	N17	E33	.562	15443	2.8	34D	-F		P	0805	30	.4	D	
ZURI	31	0803E	0812	0822	N17	E33	.562	15443	2.8	14D	-F		P	0812	50	.6		
463 KHAR	31	0756E		0828D	N24	E51	.791	15443	4.2	32D	-F		P	0805	40	.7	D	Y5
464 KHAR	31	0801E		0812D	N26	W65	.907	15428	26.5	11D	-F		P	0805	30	.8	D	Y5
465 MCMA	31	1125	1126	1148	N17	E32	.549	15443	2.9	23	-F		C	1126	40	.5	E	Y5
466 CATA	31	1215	1215	1235	N17	E29	.508	15443	2.7	20	-N	1	C	1215	56	.6		Y5
	31	1921	1934	NO FLARE PATROL														
	31	2059	2114	NO FLARE PATROL														
	31	2115	2139	NO FLARE PATROL														

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

JULY 1978

DAILY FLARE INDICES
Includes all Flares

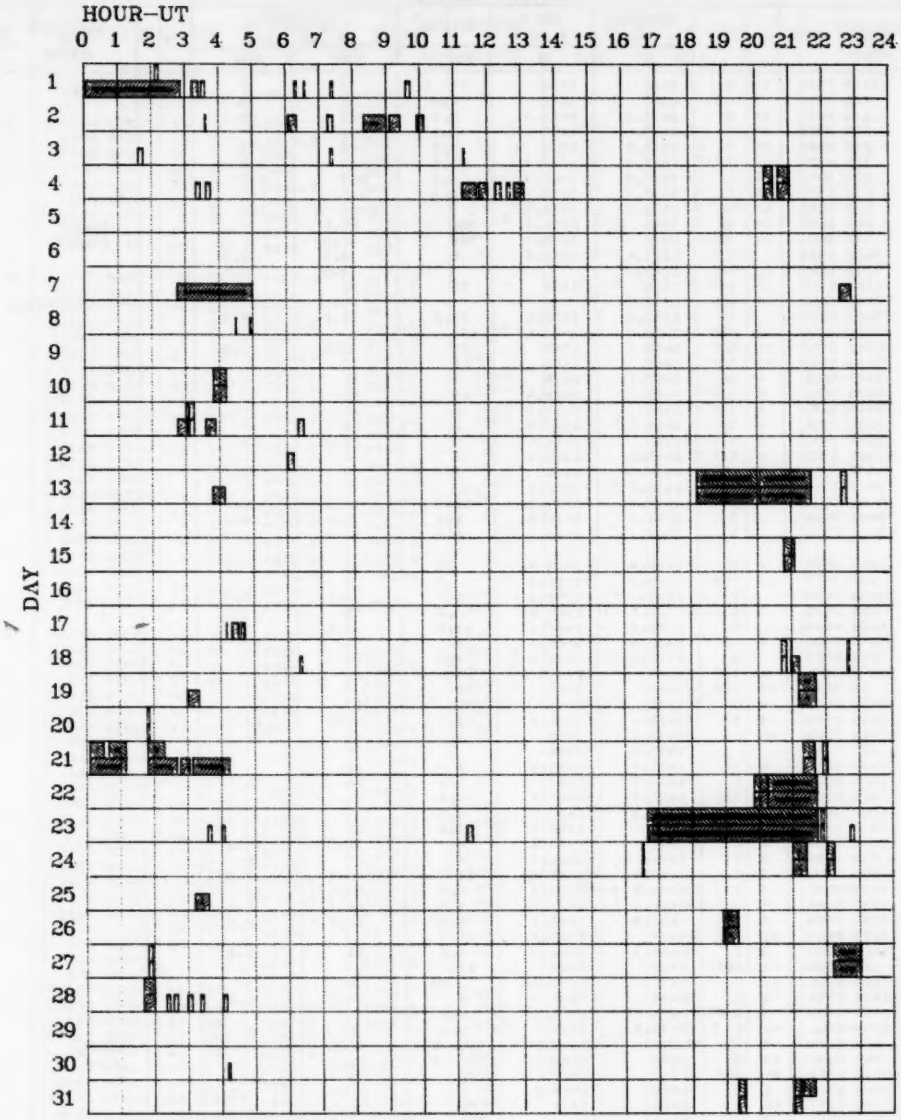
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
780701	21.96	23.9	780711	1206.32	23.8	780721	84.29	22.1
780702	11.19	24.0	780712	141.30	24.0	780722	34.42	22.1
780703	8.66	24.0	780713	75.79	20.5	780723	46.69	18.8
780704	46.60	23.4	780714	76.44	24.0	780724	9.41	23.3
780705	34.04	24.0	780715	110.09	23.7	780725	20.69	24.0
780706	32.43	24.0	780716	42.49	24.0	780726	14.05	23.6
780707	114.98	24.0	780717	102.61	24.0	780727	14.24	23.0
780708	63.72	24.0	780718	175.02	23.8	780728	7.01	23.7
780709	119.34	24.0	780719	57.45	23.5	780729	17.15	24.0
780710	440.13	23.6	780720	84.42	23.9	780730	16.26	24.0
						780731	18.58	23.2

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JULY 1978



Observatories included in total patrol:

Abastumani	Herstmonceux	Kanzelhohe	McMath-Hulbert	Tashkent
Athenes	Holloman	Kharkov	Meudon	Tehran
Bucharest	Huancayo	Kiev	Mitaka	Upice
Catania	Hurbanovo	Locarno	Monte Mario	Voroshilov
Culgoora	Istanboul	Lvov	Palehua	Wendelstein
Haute Provence	Kandilli	Manila	Ramey	Zurich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JULY 1978

JUL 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
1	3100	CRIM	40	F	0610	0713	80 D	5	2		
	260	ONDR	45	C	0637	0640	4.5	78	14		
	234	POTS	45	C	0637.3	0639.9	3.9	240	20		
	237	TRST	41	F	0637.4	0639.9	3.1	595			O
	228	HARS	45	C	0637.5	0638 U	3.5	400	130		
	200	HIRA	46	C	0637.5	0639.8	3.5	630	100		O
	202	IZMI	7	C	0637.5	0640.5	3.3	600	250		
	113	POTS	45	C	0637.9	0638.5	3.9	2000	150		
	100	HIRA	46	C	0638.5	0638.8	3	2000 U	100 U		
	245	SGMR	44	NS	0914 E	2230.3	906 D	12.5			3G,SMF
	410	SGMR	44	NS	0914 E	2236.4	906 D	40.3			3G,SMF
	9400	HUAN		S	1213.4	1215.8	4	8.5	2.9		R
	7000	SAOP	22	GRF	1249.2			8.6			
	6100	KISV	20	GRF	1328	1345	22	11			
	7000	SAOP	22	GRF	1333.2			13.3			3 COMPONENTS
	9400	HUAN		S	1341.2	1345.4	23.2	13.7	5.9		O
	1420	ARCE	21	GRF	1352.8	1458.6	134				
	2800	OTTA	21	GRF	1410	1520	230	9.8	4.9		
	6100	KISV	21	GRF	1412	1416	10	7			
	1420	BOUL	4	SF	1412.5	1416	8	11	4		
	1470	BERL	4	S/F	1413	1416.4	10	12			
	3000	BERL	4	S/F	1413	1416.2	5	22			
	2695	BOUL	4	SF	1413	1417.5	6	22	7		
	2695	PENT	4	S/F	1414	1416.5	9	23.8	7		
	1420	ARCE	4	S/F	1414.3	1415.9	8				
	4995	BOUL	2	SF	1414.5E	1416	2.5D	9	3		
	9100	ARCE	20	GRF	1450.3	1540.7	132				
	9400	HUAN		S	1507.1	1525.8	56.7	10.2	3.8		O
	9400	HUAN		S	1521.2	1521.6	1.1	9.4	4.3		O
	9400	HUAN		S	2043	2043.7	1.8	13.7	4.1		R
2	260	ONDR	3	S	0636.4	0636.4	.3	15	.8		
	408	TRST	42	SER	1128.8	1128.9	.7	32			
	9400	HUAN		S	1152.1	1152.6	1	8.1	3.9		O
	260	ONDR	3	S	1324.1	1324.1	.2	15			
	9400	HUAN		S	1353.3	1407.1	47.5	14.6	3.8		O
	2695	BOUL	4	SF	1402.5	1406.5	10	37	12		
	113	POTS		C	1402.8	1405.4	8.9	1400			
	1470	BERL	4	S/F	1403	1407	10	29			
	18	MCMA	42	SER	1403	1408	18			2	
	9500	BERL	6	S	1403	1408	27	12			
	2695	ATHN	3	S	1403.2	1405.9	10.2	42.5	12.7		
	127	TORN	45	C	1403.2	1405	9	220	30		
	127	TORN			1403.2	1406		170			
	4995	BOUL	4	SF	1403.5	1405.5	5	18	6		
	1420	BOUL	45	C	1403.5	1407	8.5	24	8		
	3000	BERL	4	S/F	1403.7	1405.4	8.3	31			
	1420	ARCE	4	S/F	1403.9	1407.1	8.5				
	7000	SAOP	4	S/F	1404	1405.9	3.2	17			
	2695	SGMR	3	S	1404	1405.8	6	37.8	15.1		
	930	BORD	3	S	1404	1405.8	5	17	8		
	4995	ATHN	3	S	1404.4	1405.9	30	28.9	8.7		
	1415	SGMR	3	S	1404.5	1407.3	5.5	32.6	13		
	4995	SGMR	3	S	1404.6	1405.8	5.4	16.7	6.7		
	8800	ATHN	3	S	1404.9	1408.3	9.9	12.7	3.8		
	9100	ARCE	22	GRF	1405	1406.3	35				
	1415	ATHN	3	S	1405.3	1406	6.4	33	9.9		
	18	MCMA	42	SER	1447	1503	18			2	
	1420	BOUL	45	C	1457.5	1458.5	3.5D	4	1		
	2800	OTTA	1	S	1458	1501	5	2.8	1.4		
	1420	ARCE	2	S/F	1458.3	1459.9	4.6				
	2695	BOUL	45	C	1458.5	1502	4.5	5	2		
	410	SGMR	43	NS	1505	1842.2	555 D	36.1			CONT
	245	SGMR	43	NS	1505	1650.1	555 D	11.2			CONT
	2800	OTTA	21	GRF	1510	1525	50	2.2	1.1		
	2800	OTTA	1	S	1550	1550.2	2	1.4	.7		
	2800	OTTA	24	R	1720	1830	70	2.2	1.1		
	2800	OTTA	27A	RF	1720		310	2.2	1.9		
	2800	OTTA	24P	R	1830		215	2.2			
	2800	OTTA	1	S	2032	2033	3	2	1		
	9400	HUAN		S	2101.8	2103.4	2.8	8.1	4.4		O
	9400	HUAN		S	2113.5	2114	1.2	6.5	4.4		L
	410	SGMR	7	S	2145.2	2149.4	5	488	146		CONT
	4995	BOUL	8	S	2148	2149	1.5	32	11		
	1420	BOUL	2	SF	2148	2149	3	5	2		
	4995	MANI	3	S	2148.5	2149.3	3	35.6	11.6		
	9400	HUAN		S	2148.8	2149.3	1.2	22.6	7.4		L
	8800	SGMR	3	S	2148.9	2149.4	1.9	23.8	7.1		CONT
	4995	SGMR	3	S	2149	2149.4	2	37.8	11.3		CONT
	8800	MANI	8	S	2149	2149.3	.6	33.4	11		
	2695	SGMR	3	S	2149	2149.4	2	13.8	4.1		CONT
	2800	OTTA	4	S/F	2149	2149.1	3	18.4	5		
	1415	SGMR	1	S	2149.2	2149.5	2.4	8.4	2.5		CONT
	2695	BOUL	4	SF	2149.5	2150.5	2	8	3		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JULY 1978

JUL 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	2800	OTTA	26 FAL	2205	2230	25	-2.2	-1.1		
3	100	HIRA	46 C	0614 E	0616	16 D	250	50		D
	260	ONDR	46 C	0619.5	0621.3	10	29	8		
	536	ONDR	45 C	0620	0621.2	7	45	8.4		
	500	HIRA	46 C	0620	0621	7	60	15		D
	808	ONDR	45 C	0620.7	0622.3	6	30	5		
	200	HIRA	46 C	0622 E	0622 U	2 D	30 U	10 U		D
	3100	CRIM	1 S	0636	0636.2	.5	3.5	1		
	2800	OTTA	28 GRF	1255	1330	145	4	2.1		
	2800	OTTA	20 GRF	1820	1830	45	1.6	.8		
4	1415	MANI	3 S	0118.6	0119.4	1.1	218.9	72.9		
	3100	CRIM	1 S	0534	0536.5	4	2	1		
	3100	CRIM	25 R	0729	0820		2			
	3100	CRIM	1 S	0732.5	0733.5	2.5	4	1		
	3000	BERL	1 S	0733	0733.4	2	5			
	9100	ARCE	21 GRF	0916.5	0939.3	109				
	8900	BERN	45 C	0941.1	0943.4	12.5	12	33		-14
	10400	BERN	45 C	0941.1	0943.4	12.5	6	19		
	8400	BERN	45 C	0941.1	0943.4	12.5	13	34		-16
	2695	ATHN	20 GRF	0941.7	0943.6	14.4	8.5	5.1		
	4995	ATHN	3 S	0942.2	0943.5	11.2	39	11.7		
	3100	CRIM	1 S	0942.2	0944	4	7	2		
	3000	BERL	4 S/F	0942.5	0943.9	43	11			
	8800	ATHN	3 S	0942.8	0943.5	5.5	25.4	7.6		
	9500	BERL	4 S/F	0943	0943.4	34	19			
	9100	ARCE	45 C	0943.1	0944.3	4				
	1470	BERL	3 S	0943.7	0943.9	.8	6			
	1420	ARCE	8 S	0943.8	0943.9	.5				
	260	ONDR	4 S/F	1015.8	1015.8	1	22	10		
	536	ONDR	3 S	1301.4	1301.4	.2	18			
	2800	OTTA	20 GRF	1530		60	1.4	1		
	2800	OTTA	20 GRF	1905	2000	115	1.8	1.2		
5	260	ONDR	44 NS	0532 E		433	21			
	410	SGMR	44 NS	0916 E	1102	903 D	8.8			5,CONT
	245	SGMR	44 NS	0916 E	1017.5	903 D	46.3			5,CONT
	127	TORN	27 RF	1030 U	1215	140 U	50	15		
	405	KIEL	45 C	1130	1155	88	800	70		
	930	BORD	46 C	1132	1140	89	198	30		
	800	KIEL	45 C	1132	1140.5	92	1000	130		
	808	ONDR		1132.5	1155		110			
	808	ONDR		1132.5	1236.5		78			
	808	ONDR	49 GB	1132.5	1140	88	263	60		
	808	ONDR		1132.5	1259.2		104			
	2800	OTTA	28 PRE	1134	1147.5	28	13.2			
	3100	CRIM	28 RPE	1134	1145.5	19.5	6			
	3000	BERL	46 C	1135	1206.5	160	86			
	1470	BERL	46 C	1135	1235	190	325			
	9500	BERL	6 S	1135	1206.5	105	23			
	1415	SGMR	4 S/F	1135.5	1234.8	69.5	308.4	123.4		CONT
	1415	ATHN	14 C	1135.5	1235.7	84.5	307.4	92.2		
	1420	ARCE	23 GRF	1135.6	1142.7	120				
	1420	KIEL	45 C	1136	1236	69	550	240		
	536	ONDR	49 GB	1137	1154.3	82	370	49		
	536	ONDR		1137	1156.8		332			
	536	ONDR		1137	1233		53			
	602	KIEL	45 C	1137	1155	86	800	80		
	2695	ATHN	20 GRF	1137.8	1206.5	81.4	115.4	69.2		
	606	SGMR	47 GB	1137.8	1155	67.2	773	309.2		CONT
	7000	SAOP	20 GRF	1138.6			46.7	37		
	408	TRST	49 GB	1139.4	1156.7	62.9	330 D			
	240	KIEL	45 C	1140	1203	82	230	30		
	2650	DWIN	45 C	1140	1207	50	110	50		
	10400	BERN	20 GRF	1142.1	1207.6	320	12	35		
	8400	BERN	20 GRF	1142.1	1207.6	320	15	39		-11
	8900	BERN	20 GRF	1142.1	1207.6	320	14	38		-8
	9100	ARCE	20 GRF	1143.7	1207.3	69				
	113	POTS	45 C	1144	1203	82	30	12		
	228	HARS	47 GB	1145	1202.5	65	330	30		
	4995	ATHN	20 GRF	1145.2	1206.3	75.5	71.6	42.9		
	3100	CRIM	1 S	1146	1147.5	3.5	4	1		
	1420	ARCE		1152.9	1154.9	7				
	1420	ARCE	46 C/F	1152.9	1234.5	51.5				
	245	SGMR	7 C	1153	1203.2		478			CONT
	245	SGMR	7 C	1153	1158	54	124	191		CONT
	234	POTS	45 C	1153	1203	72	300	20		
	237	TRST	47 GB	1153.1	1203	52.9	600			50R
	410	SGMR	49 GB	1153.3	1155.3	53.7	976	391		CONT
	3100	CRIM	29 PBI	1153.5	1218	55	22			
	3100	CRIM	7 C	1153.5	1206.1	24	81			
	260	ONDR	49 GB	1154	1202.4	50	212	62		
	2800	OTTA	4 S/F	1154	1206.5	36	96	36.8		
	4995	SGMR	20 GRF	1154	1206	41	46.6	18.6		CONT

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	2695	SGMR	3 S	1156	1206.8	39	105	41.9		CONT
	1420	ARCE		1159.1	1203.1	25.5				
	9400	HUAN	S	1159.2	1206.1	18.3	20.7	10.4		L
	8800	SGMR	20 GRF	1202.5	1207	32.5	26.4	7.9		CONT
	8800	ATHN	3 S	1203.5	1207.5	9.8	36.2	21.7		
	18	MCMA	6 S	1223	1227	6			1	
	1420	ARCE		1224.6	1228.1	6.9				
	2800	OTTA	29 PBI	1230	1230	170	9.6	3		
	1420	ARCE		1231.5	1232.7	2.1				
	1420	ARCE		1233.6	1234.5	10				
	930	BORD		1236.6			155			
	2800	OTTA	240AR	1610	1900	170	6			
	8800	ATHN	4 S/F	1612.5	1616.9	8.8	79.5	23.9		
	800	KIEL	45 C	1740	1822.5	62	260	130		
	1415	SGMR	45 C	1742.1	1820		59.4			2,CONT
	1415	SGMR	45 C	1742.1	1800.5	67.2	34.2	10.3		2,CONT
	2800	OTTA	40 F	1745	1800	45	26			
	245	SGMR	7 C	1747	1804.1	63	26.9	8.1		2,CONT
	410	SGMR	6 S	1747	1800.7	63	109	32.7		2,CONT
	245	SGMR	7 C	1747	1823		56.8			2,CONT
	228	HARS	27 RF	1747.5	1823.2	120 U	70	10		SUNSET
	930	BORD	46 C	1748	1822	61	83	19		
	1420	KIEL	45 C	1748	1820	63	190	140		
	1420	BOUL	41 F	1748	1820 U	60 D	32	11		
	2695	BOUL	41 F	1748.5	1801	43.5	26	9		
	606	SGMR	45 C	1748.5	1800.3	60.2	102	30.6		2,CONT
	606	SGMR	45 C	1748.5	1823.7		109			2,CONT
	240	KIEL	45 C	1750	1801.5	50	60	15		
	405	KIEL	45 C	1750	1800.5	60	100	30		
	2695	SGMR	4 S/F	1754.7	1803.3	34.6	33.3	10		2,CONT
	602	KIEL	45 C	1757	1818	66	110	70		
	9400	HUAN	S	1818.2	1818.7	1.1	8	7.2		0
	606	SGMR	20 GRF	1856.5	1926	63.5	38.1	11.4		
	410	SGMR	6 S	1900.5	1922	66.7	63.2	19		
	606	MANI	8 S	2217.1	2217.5	.8	28.7	9.6		
	1415	MANI	8 S	2217.3	2217.5	.4	8.1	2.7		
	606	MANI	8 S	2230.5	2230.9	.8	31.7	10.6		
	1415	MANI	8 S	2230.6	2230.7	.6	8.1	2.7		
6	260	ONDR	44 NS	0524 E		585 D	12			
	127	TORN	44 NS	0640 E		510 D		4.5		V=0
	410	SGMR	44 NS	0917 E	1716.3	902 D	11.6			3G,CONT
	245	SGMR	44 NS	0917 E	2058.4	902 D	22.9			3G,CONT
	9100	ARCE	1 S	1111.3	1111.7	1				
	9400	HUAN	S	1205.6	1208.7	4.9	10	5.3		0
	2800	OTTA	21 GRF	1500	1600	150	4.2	2.1		
	9100	ARCE	21 GRF	1504.8		150				
	7000	SAOP	4 S/F	1509.2	1512	.8	23	13		
	7000	SAOP	41 F	1509.2						2
	1420	BOUL	45 C	1510	1512	3.5	10	3		
	8400	BERN	45 C	1510.2	1512.1	18	10	27		0
	8800	SGMR	3 S	1510.2	1511.8	4.3	19.1	5.7		S,SWF
	8900	BERN	45 C	1510.2	1512.1	18	10	27		0
	10400	BERN	45 C	1510.2	1512.1	18	10	30		
	8800	ATHN	3 S	1510.3	1511.8	4.8	26.9	16.2		
	4995	BOUL	45 C	1510.5	1511.5	3.5	14	5		
	1420	ARCE	40 F	1510.6	1511.9	4.2				
	4995	ATHN	3 S	1510.7	1511.8	4.1	17	10.3		
	2695	ATHN	3 S	1510.8	1511.8	4.9	12.4	7.4		
	4995	SGMR	3 S	1510.8	1511.9	4.2	20.6	6.2		S,SWF
	1415	SGMR	3 S	1510.9	1512.2	4.1	16.1	4.8		S,SWF
	2695	SGMR	3 S	1510.9	1512.2	4.1	13.4	4		S,SWF
	15400	SGMR	3 S	1510.9	1512	4.3	31.3	9.4		S,SWF
	9100	ARCE	4 S/F	1510.9	1512.3	6				
	930	BORD	41 F	1511	1511	2	21	3		
	2800	OTTA	4 S/F	1511	1512	4	13	3.7		
	2650	DWIN	49 C	1511	1512	4	15	10		
	18	MCMA	6 S	1511	1512	2			1	
	228	HARS	6 S	1511.5	1512	1.3	280 D	100		
	2695	BOUL	45 C	1511.5	1513	6.5	11	4		
	606	SGMR	3 S	1511.8	1511.9	.6	96.2	28.9		S,SWF
	237	TRST	41 F	1511.8	1512	.5	245			0
	245	SGMR	6 S	1512	1512.2	.9	206	61.8		S,SWF
	410	SGMR	6 S	1512	1512.2	.5	154	46.2		S,SWF
	2695	BOUL	3 S	1520 E	1520.5	4.5D	45	15		
	1420	BOUL	3 S	1527 E	1530 U	6.5D	27	9		
	1415	SGMR	3 S	1527.3	1530.1	7	36.5	11		4,SWF
	2695	SGMR	3 S	1527.4	1530	6.9	67.9	20.4		4,SWF
	2695	ATHN	4 S/F	1527.5	1529.5	5.8	61.8	18.5		
	1420	ARCE	3 S	1527.7	1529.9	8				
	930	BORD	3 S	1528	1530.8	9	27	7		
	2800	OTTA	3 S	1528	1530	7	51	15.2		
	1415	ATHN	3 S	1528.3	1529.8	4.4	39.8	11.9		
	7000	SAOP	4 S/F	1528.4	1529.7	1.6	15.5			
	4995	BOUL	4 SF	1528.5	1529	4	25	8		

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	4395	ATHN	4 S/F	1529	1529.6	4	64.8	19.4		
	2650	DWIN	45 C	1529	1530	4	65	20		
	4995	SGMR	3 S	1529.1	1529.7	7.9	27.9	8.4		4,SWF
	237	TRST	47 GB	1529.2	1531.9	4.4	1450			8L
	9100	ARCE	20 GRF	1529.2	1556.3	87				
	245	SGMR	48 GB	1529.3	1530	7.7	1150	345		4,SWF
	410	SGMR	6 S	1529.3	1533.4	5.3	21.2	6.4		4,SWF
	606	SGMR	3 S	1529.4	1533.2	8.2	85.8	25.7		4,SWF
	228	HARS	48 C	1529.5	1531	5.5	800	400		
	18	MCMA	42 SER	2057	2059	15			1	
	9400	HUAN	S	2058.7	2059.2	1.7	8.2	2.7		R
7	200	HIRA	46 C	0524	0527	15	80	30		0
	260	ONDR	44 NS	0528 E		593 D	17			
	410	SGMR	44 NS	0917 E	1845.8	902 D	17.5			CONT
	245	SGMR	44 NS	0917 E	1156.6	902 D	21.3			CONT
	2695	ATHN	3 S	0530.6	0536.7	11.5	21.5	12.9		
	3100	CRIM	3 S	0531	0537	14	23	8		
	4995	ATHN	3 S	0531	0536.7	12.8	55.4	33.2		
	5730	IRKU		0531	0536.9		33	7		R
	5730	IRKU	45 C	0531	0533.3	12	10			L
	260	ONDR	46 C	0533	0534	10.5	61	14.3		
	202	IZMI	41 F	0533.8	0537.5	9.2	90			
	228	HARS	48 C	0534	0535.5	14	240	15		
	8400	BERN	4 S/F	0534.3	0536.6	16	13	36		0
	8900	BERN	4 S/F	0534.3	0536.6	16	12	33		0
	808	ONDR	45 C	0534.5	0540.2	9	39	11.7		
	8800	ATHN	3 S	0534.8	0536.8	7.4	41.7	25		
	4995	MANI	3 S	0535	0537.2	6.8	36.6	12.2		IG
	2695	MANI	4 S/F	0535	0537.1	4.5	25.1	8.4		
	536	ONDR	42 SER	0535	0540.2	38	9	1		
	1415	MANI	4 S/F	0535.1	0541	6.6	28.3	9.4		
	100	HIRA	46 C	0536.5	0537.7	6	1200 U	300		
	8400	BERN	46 C	0930.7	0935.2	11	43	116		0
	8900	BERN	46 C	0930.7	0935.2	11	41	112		0
	10400	BERN	46 C	0930.7	0935.2	11 U	10 D	30 D		
	3000	BERL	4 S/F	0931.5	0934.5	9	56			
	4995	ATHN	4 S/F	0931.7	0935.4	8.8	117.6	35.3		
	9500	BERL	4 S/F	0931.7	0935	8.3	68			
	3100	CRIM	30 PBI	0932	0940.1	36	2			
	3100	CRIM		0932	0939		24	8		
	3100	CRIM	7 C	0932	0934.6	8	60	20		
	200	HIRA	46 C	0932	0948 U	20 D	500 U	200 U		0
	2650	DWIN	45 C	0932	0935	8	60	30		
	2695	ATHN	4 S/F	0932	0934.8	8.7	57.4	17.2		
	808	ONDR	21 GRF	0932.5	0937.6	7	16	10.7		
	9100	ARCE	4 S/F	0932.8	0935.2	7.5				
	234	POTS	45 C	0933	0944	22	320	100		
	10715	DWIN	45 C	0933	0935	7	70	30		
	536	ONDR	46 C	0933	0939.2	14	55	15		
	930	BORD	3 S	0933	0935.5	7	10	5		
	1420	ARCE	46 C/F	0933.4	0934.6	8.5				
	1470	BERL	4 S/F	0933.5	0934.8	8.9	15			
	113	POTS	45 C	0933.6	0933.7	2	125	10		
	8800	ATHN	4 S/F	0933.7	0935.4	6.3	97.2	29.2		
	237	TRST	41 F	0933.7	0933.8	.2	185			0
	228	HARS	47 GB	0933.7	0943	24	350	60		
	202	IZMI	45 C	0933.7	0947.5	18.8	470	240		
	1415	ATHN	3 S	0934	0935.4	2.4	5.5	3.3		
	100	HIRA	46 C	0934	0934	2	500	250		
	410	SGMR	3 S	0937	0949	18.5	92.9	37		5,CONT
	408	TRST	49 GB	0937.1	0943.1	10.3	140			
	237	TRST	47 GB	0937.3	0942.8	12.8	625			5L
	260	ONDR	46 C	0938	0943	11	189	148		
	9100	ARCE	29 PBI	0940.3		31				
	245	SGMR	3 S	0942.5	0949.3	15.5	339	140		5,CONT
	1470	BERL	1	0946	0946.8	2.1	2.5			
	3000	BERL	4 S/F	0946	0946.8	2.7	8.7			
	3100	CRIM	1 S	0946	0947	2	5	2		
	127	TORN	45 C	0946.1	0947.1	6	65	25		
	2695	ATHN	3 S	0946.1	0946.8	1.1	7.2	2.2		
	2800	OTTA	240AR	1205	1223	18	2	1		
	10400	BERN	45 C	1208 U	1213.3	9 U	10 D	30 D		
	7000	SAOP	46 C	1209	1213.1		45.6	8		2 COMPONENTS
	2800	OTTA	4 S/F	1210	1213	12	14.2	5.6		
	3000	BERL	4 S/F	1210	1213.2	5.6	13			
	9400	HUAN	C	1210.4	1213.2	4.4	39.7	18.3		0
	2695	SGMR	3 S	1210.4	1213.4	5.2	16	6.4		CONT,SWF
	4995	ATHN	3 S	1210.5	1213.2	9	48.2	14.5		
	1420	ARCE	4 S/F	1210.5	1212.5	4.8				
	15400	SGMR	3 S	1210.5	1213.4	4.5	24.5	9.8		CONT,SWF
	4995	SGMR	3 S	1210.5	1213.1	5	32.3	12.9		CONT,SWF
	9500	BERL	4 S/F	1210.6	1213.1	4.3	29			
	9100	ARCE	45 C	1210.8	1213.3	3.6				RECORDDISTURBED
	1470	BERL	4 S/F	1210.8	1212.6	4.7	11			

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	8800	SGMR	3 S	1211	1213.2	4	48.5	19.4		CONT,SWF
	8800	ATHN	3 S	1211	1213.2	5.3	38.6	11.6		
	930	BORD	3 S	1211	1212.6	3	12	6		
	1415	SGMR	3 S	1211.1	1212.8	3.4	12.6	5		CONT,SWF
	2695	ATHN	3 S	1211.2	1213.1	4.1	14	4.2		
	1415	ATHN	3 S	1211.5	1212.5	1.9	11	3.3		
	9100	ARCE	29 PBI	1214.4		25				
	9400	HUAN	PBI	1214.8	1214.8	34.6	6.6	2.1		D
	930	BORD	8 S	1301.2	1301.2	.1	19	1		
	234	POTS	1 S	1330.1	1331	1.4	210	70		
	2695	SGMR	3 S	1438.4	1441.2	6.8	15	4.5		CONT,SWF
	7	SAOP	4 S/F	1439	1441	1.5	19.7			
	4995	BOUL	4 SF	1439	1440.5	3.5	18	6		
	1420	BOUL	1 S	1439	1441.5	4.5D	3	1		
	2800	OTTA	21 GRF	1439	1530	76	2.4	1.4		
	9400	HUAN	S	1439.4	1441	3	18.2	7		D
	4995	SGMR	3 S	1439.5	1441.1	4.7	20.4	6.1		CONT,SWF
	2300	OTTA	3 S	1439.5	1441	4	11.8	8.4		
	9100	ARCE	1 S	1439.5	1441.1	14				
	8800	SGMR	3 S	1439.7	1441	4.2	16.4	4.9		CONT,SWF
	4995	ATHN	3 S	1439.7	1441.2	5.1	24.2	14.5		
	2695	ATHN	3 S	1439.8	1441.4	4.5	14	8.4		
	8300	BERN	20 GRF	1439.8	1440.8	3.2	5	12		D
	10400	BERN	20 GRF	1439.8	1440.8	3.2	3	8		
	8400	BERN	20 GRF	1439.8	1440.8	3.2	5	14		D
	8800	ATHN	3 S	1439.9	1441.2	4.3	14.5	8.7		
	2695	BOUL	4 SF	1440	1442.5	4.5	12	4		
	2650	DWIN	3 S	1440	1442	5	15	5		
	1420	ARCE	1 S	1440.5	1441.5	3.5				
	2695	SGMR	3 S	1641	1643.1	3.1	10.5	5.3		CONT,SWF
	4995	SGMR	3 S	1641.1	1642.9	3.4	11.4	5.7		CONT,SWF
	8800	SGMR	1 S	1641.3	1642.8	2.9	6	3.1		CONT,SWF
	8400	BERN	3 S	1642.2	1642.8	4	9	24		D
	7000	SAOP	4 S/F	1642.2	1642.9	.6	12			
	8300	BERN	3 S	1642.2	1642.8	4	9	24		D
	10400	BERN	3 S	1642.2	1642.8	4	4	12		
	9400	HUAN	S	1642.6	1642.9	1.4	14.9	9.2		D
	4995	BOUL	4 SF	1742.5	1743.5	2.5	13	4		
	1420	BOUL	2 SF	1746.5	1747	1	5	2		
	9400	HUAN	ABS	1755.6	1759	20.7	-6.6	-1.2		D
	2800	OTTA	240 R	1758	1800	2	1.2	.6		
	2800	OTTA	20 GRF	1810	1900	160	4.8	2.4		
	200	HIRA	46 C	1935 E	2110 U	165 D	100	30		WR
	100	HIRA	46 C	1954	1954.3	2	2000 U	500 U		
	245	SGMR	6 S	2105	2111	21	29.9	12		CONT
	245	SGMR	6 S	2353.5	2403	25.5D	59.5	23.8U		CONT
	410	SGMR	6 S	2356	2359.8	23 D	9.8	3.9U		CONT
8	202	IZMI	43 NS	0600		310	20			
	260	ONDR	44 NS	0605 E		553 D	34	2		
	410	SGMR	44 NS	0918 E	1548.2	901 D	35			3G,5,CONT
	245	SGMR	44 NS	0918 E	1819.5	901 D	127.1			3G,5,CONT
	200	HIRA	43 NS	2026	2320	424	30	5		WL
	6100	KISV	3 S	0623.2	0624.1	3	4			
	3100	CRIM	1 S	0624	0624.5	1	2	1		
	15000	KISV	8 S	0647	0647.2	1	10			
	6100	KISV	3 S	0647.3	0648	2	11			
	113	POTS	1 S	0757.8	0758	.6	800	250		
	245	SGMR	6 S	1027	1027.4	1.2	192	76.8		
	2800	OTTA	1 S	1050	1051	5	6.8	2.4		
	3100	CRIM	1 S	1050	1051.1	3	5	2		
	6100	KISV	4 S/F	1050	1051.2	4	9			
	930	BORD	41 F	1107	1107.2	.5	12	2		
	808	ONDR	1 S	1107	1107	.2	25			
	808	ONDR	1 S	1240.8	1240.8	.2	22			
	234	POTS	1 S	1240.9	1241	1.1	350	120		
	2800	OTTA	8 S	1241	1241.1	.5	2	1		
	536	ONDR	8 S	1241	1241	.3	91			
	260	ONDR	8 S	1241.2	1241.2	.3	162			
	2800	OTTA	20 GRF	1500	1600	100	2.6	1.3		
	2800	OTTA	21 GRF	1705		530 D	16			
	9400	HUAN	S	1716.4	1717.5	2.9	9.9	4.7		R
	9400	HUAN	S	1809.1	1831.8	42.6	8.3	3		R
	9400	HUAN	PRE	1910.7	1946.1	35.4	9.9	4.5		R
	200	HIRA	46 C	1935 E	1955 U	51	350 U	50 U		WL
	2695	SGMR	45 C	1942.3	2000.5	61.7	185	152		3G,5,CONT,
	2695	SGMR	45 C	1942.3	2016.4		381			SWF
	2695	BOUL	45 C	1942.5E	2018	87 D	356	119		
	2800	OTTA		1943	1951	14.5	79			
	2800	OTTA	46F C	1943	2016.5	72	420	73		
	4995	SGMR	45 C	1944	2016.1		332			SWF
	4995	SGMR	45 C	1944	1955.3	60	166	133		3G,5,CONT,
	1415	SGMR	45 C	1946	2016.7		190			SWF
	1415	SGMR	45 C	1946	2000.4	58	66.2	76		3G,5,CONT,
	4995	BOUL	45 C	1946	2017.5U	48.5D	220	73		

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	1420	BOUL	45 C	1946	2017 U	85 D	139	46		
	9400	HUAN	C	1946.1	1951	44.9	363.6	123.1		R
	9400	HUAN		1946.1	1953.8		256.1			
	8800	SGMR	45 C	1946.5	1950.9	53.2	298	119		3G,5,CONT,
	8800	SGMR	45 C	1946.5	2016.5		152			SWF
	606	SGMR	3 S	1947	1950.9	52.7	128	51.2		3G,5,CONT,
	15400	SGMR	45 C	1948	2016.2		98.2			SWF
	15400	SGMR	45 C	1948	1950.8	51.4	347	139		3G,5,CONT,
	410	SGMR	6 S	1949.5	2000.7	34.4	143	57.2		SWF
	500	HIRA	46 C	1950	1952.7	6	70	30		WR
	245	SGMR	6 S	1950.4	1958.5	29.6	164	65.6		3G,5,CONT,
	2800	OTTA		1957.5	2000.5	6.5	98			
	2800	OTTA		2004	2016.5	51	420			
	9400	HUAN	PBI	2031	2031	23	43	26.8		R
	2800	OTTA	30 PBI	2055	2055	65	5.2	2.4		
	2695	SGMR	1 S	2059.4	2101	1.4	8.4	3.4		CONT
	4995	SGMR	3 S	2100	2100.6	2	14.8	5.9		CONT
	2800	OTTA	45 C	2100	2100.2	9	4.4	1.8		
	9400	HUAN	S	2100.1	2100.6	1.2	9.9	5		R
	1415	SGMR	3 S	2100.5	2101.3	3.5	11	4.4		CONT
	9400	HUAN	S	2109	2112.8	9.8	11.6	5.5		R
	9400	HUAN	S	2220.1	2220.7	1.2	16.5	12.1		0
	1415	MANI	3 S	2332.2	2333.7	3	170.1	56.7		
	2695	PENT	1 S	2500	2501.5	4	5.8	2.2		
9	2695	BOUL	2 SF	0100.5	0102	4	5	2		
	4995	MANI	3 S	0100.7	0101.3	4.4	92.3	30.8		
	2695	MANI	1 S	0100.8	0101.6	1.9	5.8	1.9		
	6100	KISV	3 S	0443	0444	3	7			
	1415	MANI	4 S/F	0517	0517.9	2	17.4	5.8		I
	1415	MANI	4 S/F	0527.8	0529.5	8.7	44.4	14.8		
	8900	BERN	3 S	0550	0557.9	13	18	50		0
	10400	BERN	3 S	0550	0557.9	13	19	56		
	8400	BERN	3 S	0550	0557.9	13	18	49		0
	8800	ATHN	3 S	0552.3	0558.2	7.9	43.9	13.2		
	4995	ATHN	3 S	0552.8	0558.2	7.2	9.9	3		
	15000	KISV	8 S	0555	0558	5	43 D			
	6100	KISV	3 S	0557	0558	3	11			
	260	ONDR	44 NS	0602 E		553 D	125	18		
	127	TORN	44 NS	0640 E	1153.8	520 D	160	63		V=1
	410	SGMR	44 NS	0919 E	1318.1	899 D	69.9			CONT
	245	SGMR	44 NS	0919 E	1323.9	899 D	493			CONT
	228	HARS	43 NS	1141.5	1237.2	240 D	265	40		
	808	ONDR	8 S	0612.5	0612.5	.2	46			
	234	POTS	45 C	0635.5	0713	73	25	7		
	6100	KISV	8 S	0702	0703	2	92			
	127	TORN	46 C	0705.2	0712.7	8.5	670 U			
	808	ONDR	46 C	0705.8	0710.8	17	34	2.2		
	6100	KISV	8 S	0706	0707	4	44			
	536	ONDR	41 F	0706	0713.2	13	57	3		
	8400	BERN	3 S	0706.1	0707.1	13	30	80		+9
	8900	BERN	3 S	0706.1	0707.1	13	30	83		+10
	10400	BERN	3 S	0706.1	0707.1	13	26	74		
	8400	BERN	3 S	0706.1	0715.5	13	35	94		-5
	8900	BERN	3 S	0706.1	0715.5	13	40	106		-2.5
	10400	BERN	3 S	0706.1	0715.5	13	51	148		
	5738	IRKU	1 S	0706.4	0707.1	3	36	7		0
	9500	BERL	3 S	0706.5	0707.1	2.5	50			
	3000	BERL	3 S	0706.5	0707.1	3.2	11			
	3100	CRIM	1 S	0706.5	0707	2	8	3		
	1470	BERL	3 S	0706.5	0707.2	1.5	6.4			
	4995	ATHN	45 C	0706.7	0707.3	9	39.6	11.9		
	4995	ATHN	45 C	0706.7	0713.7		36.3	10.9		
	2695	ATHN	4 S/F	0706.8	0712.3	9.4	117	35.1		
	8800	ATHN	4 S/F	0706.8	0713.7	12.5	107.4	32.2		
	4995	MANI	4 S/F	0706.8	0707.4	9.4	31	10.3		I
	237	TRST	41 F	0706.9	0707.1	.4	960			13R
	15000	KISV	8 S	0707	0707.8	3 D	39			
	113	POTS	45 C	0707 E	0714.5	18 D	650			
	1415	ATHN	4 S/F	0707	0712.3	8.8	193.8	58.1		
	1415	MANI	4 S/F	0707	0712.4	8.7	139.2	46.4		
	930	BORD	46 C	0709	0712.2	11	156	6		
	1470	BERL	4	0710	0712.2	10	254			
	6100	KISV	8 S	0710	0713.3	5	53			
	202	IZMI	20 GRF	0710	0711.5	14	140	100		
	500	HIRA	42 SER	0710.3	0713.3	7	260			WL
	2695	MANI	4 S/F	0710.5	0712.4	5.3	106.2	35.4		
	3000	BERL	4 S/F	0710.5	0711.7	4.5	49			
	3100	CRIM	3 S	0710.5	0713.5	5	28	9		
	9500	BERL	4 S/F	0711	0713.5	4	95			
	1420	ARCE	40 F	0711.6	0712	4				INT AT 9100 MHZ
	5738	IRKU		0711	0713.8	5	36	12		0
	15000	KISV	8 S	0712	0714	4	44 D			
	237	TRST	41 F	0712.1	0712.7	.8	720			14R
	9100	ARCE	20 GRF	0736.6	0746.4	27.5				

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	3100	GRIM	25 R	0837	0855		8			
	10400	BERN	20 GRF	0848	0850.7	28	3 U	10 U		
	8400	BERN	20 GRF	0848	0850.7	28	4 U	10 U		O
	8900	BERN	20 GRF	0848	0850.7	28	4 U	10 U		
	6100	KISV	30 PBI	0849	0851.3	14	17			
	9100	ARCE	1 S	0850	0850.9	9.5				
	127	TORN	46 C	0915.4	0919.4	5.2	120			
	237	TRST	41 F	0915.8	0915.8	.2	300			2L
	1415	MANI	4 S/F	0925.2	0925.4	9.9	40	13.3		
	6100	KISV	21 GRF	0933	0943	23	16			
	113	POTS	45 C	0948.5	1017	67	70	10		
	237	TRST	41 F	0952.3	0952.4	.3	780			13R
	127	TORN	48 C	1000 U	1016.8	28	520			
	202	IZMI	2 S/F	1005	1008	3.5	130	85		
	6100	KISV	7 C	1007	1011.3	15	128			
	808	ONDR	20 GRF	1007	1010.5	6	8	4.2		
	4995	ATHN	4 S/F	1007.7	1012.1	36.3	95.7	28.7		
	1415	ATHN	3 S	1008.3	1010.6	30.5	17.1	5.1		
	113	POTS	48 C	1008.6	1009.8	11	700	35		
	8800	ATHN	4 S/F	1008.7	1012	36	266.4	79.9		
	2695	ATHN	3 S	1008.7	1010.5	31.9	29.3	8.7		
	15400	SGMR	3 S	1009	1011.8	4.5	196	51.8		3G,SWF
	15000	KISV	8 S	1009	1011.8	4	86			
	3000	BERL	4 S/F	1009	1010.2	4.2	21			
	536	ONDR	46 C	1009	1009.8	.5	56	4.2		
	930	BORD	3 S	1009	1010.7	4	20	4		
	8800	SGMR	3 S	1009.3	1012.7	5.2	203	60.9		3G,SWF
	9100	ARCE	45 C	1009.4	1011.9	3.3				
	4995	SGMR	3 S	1009.4	1011.8	5.2	83.5	25.1		3G,SWF
	10400	BERN	45 C	1009.4	1011.8	14	72	210		
	8400	BERN	45 C	1009.4	1011.8	14	80	210		+8
	8900	BERN	45 C	1009.4	1011.8	14	78	210		+10
	9100	ARCE		1009.4	1011	2				
	1420	ARCE	4 S/F	1009.4	1010.1	3.6				
	3100	GRIM	1 S	1009.5	1010.5	3.5	27	9		
	1470	BERL	4 S/F	1009.5	1010.3	4	16			
	9500	BERL	4 S/F	1009.5	1011.5	8	134			
	2695	SGMR	3 S	1009.6	1010.3	3.7	29.2	8.8		3G,SWF
	1415	SGMR	3 S	1009.7	1010.4	3.6	14.3	4.3		3G,SWF
	408	TRST	42 SER	1009.8	1010.3	1.2	230 D			
	237	TRST	5 S	1009.8	1009.8	.1	165	37		18L
	245	SGMR	6 S	1009.9	1010	3.4	125	37.5		3G,SWF
	410	SGMR	7 S	1010	1010.4	3.7	456	137		3G,SWF
	606	SGMR	47 GB	1010.6	1010.8	2.6	521	156		3G,SWF
	9100	ARCE		1011.4	1011.9	1.3				
	408	TRST	48 C	1012.7	1013.1	.8	210 D			
	9100	ARCE	29 PBI	1012.7		10				
	113	POTS	45 C	1112.5	1307	200 D	325			
	7000	SAOP	46 C	1113	1212.7		164.5			4 COMPONENTS
	9100	ARCE	21 GRF	1114.5	1147.8	180				
	237	TRST	41 F	1115.5	1115.5	.1	400			17R
	6100	KISV	28 PRE	1122	1146	38	69			
	9500	BERL	21 GRF	1125	1230	130	54			
	1470	BERL	21 GRF	1126	1225.5	109	14			
	3000	BERL	21 GRF	1128	1234	147	21			
	8800	ATHN	20 GRF	1129.9	1144.8	25.4	48.5	29.1		
	4995	ATHN	20 GRF	1130.1	1144.8	26.4	38.7	23.2		
	15400	SGMR	3 S	1131	1146.2	23	60.8	18.2		5,SWF
	2695	ATHN	20 GRF	1131.2	1144.7	24.1	16.5	9.9		
	1415	ATHN	20 GRF	1132.8	1144.7	22.1	11.8	7.1		
	8800	SGMR	3 S	1133.4	1153.2	22.6	178	53.4		5,SWF
	1420	ARCE	23 GRF	1133.7	1225.3	84.5				
	808	ONDR	21 GRF	1134	1251.2	106	20	9.9		
	8900	BERN	23 GRF	1134.2	1146.2	29	31	85		+21
	10400	BERN	23 GRF	1134.2	1146.2	29	31	91		
	8400	BERN	23 GRF	1134.2	1146.2	29	33	87		+28
	4995	SGMR	3 S	1134.7	1146.2	22.3	77.6	23.3		5,SWF
	2695	SGMR	3 S	1136.4	1146.4	20.9	118	35.4		5,SWF
	234	POTS	45 C	1136.5	1238	176 D	200			
	3000	BERL	3 S	1136.5	1139	4	23			
	1415	SGMR	3 S	1136.7	1146.2	20.1	52.7	15.8		5,SWF
	1420	ARCE	28 PRE	1136.8	1138.3	8.2				
	930	BORD	40 F	1137	1139.4	19	31	4		
	1470	BERL	4 S/F	1137	1138.5	3.5	19			
	536	ONDR	4 S/F	1138.5	1139.2	2	46	3		
	536	ONDR	21 GRF	1138.5	1254	190	53	39		
	606	SGMR	3 S	1138.5	1146.2	16.3	36.1	10.8		5,SWF
	245	SGMR	6 S	1140.6	1141.5	9.4	130	54		5,SWF
	410	SGMR	6 S	1140.6	1143.6	9.4	19.6	5.9		5,SWF
	237	TRST	41 F	1141.4	1141.5	.9	420			14R
	9400	HUAN	C	1143 E	1146 U	10.6	100.4	47.2		R
	202	IZMI	41 F	1143.5	1143.8	19.5	240	85		
	15000	KISV	8 S	1144	1146	4	41			
	1470	BERL	4 S/F	1145	1146.1	9	48			
	3000	BERL	4 S/F	1145	1146.2	9	96			

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	1420	ARCE	4 S/F	1145	1146.1	5.3				
	1415	ATHN	3 S	1145.5	1146.3	8.7	41.3	12.4		
	113	POTS	45 C	1145.5	1145.8	1.1	1700	400		
	9500	BERL	4 S/F	1145.5	1146	3	76			
	127	TORN	47 GB	1145.7	1146	1	720	360		
	8800	ATHN	4 S/F	1145.7	1146.4	3.2	75.5	22.6		
	4995	ATHN	4 S/F	1145.8	1146.6	6.9	63.4	19		
	2695	ATHN	4 S/F	1145.8	1146.6	6.9	103	30.9		
	9100	ARCE	4 S/F	1145.8	1146.3	1.6				
	1420	ARCE	29 PBI	1150.3	1151	10				
	113	POTS	1 S	1202.1	1202.1	.1	210	60		
	234	POTS	45 C	1202.1	1202.1	.2	350	120		
	237	TRST	41 F	1202.2	1202.2	.2	575			0
	245	SGMR	7 S	1202.2	1307	67.4	474	190		2,SWF
	15400	SGMR	3 S	1202.8	1212.8	62.2	129	51.6		2,SWF
	410	SGMR	6 S	1204	1255.7	65	210	84		2,SWF
	606	SGMR	47 GB	1204.9	1239	64.1	521	208		2,SWF
	6100	KISV	45 C	1205	1213	60	212			
	2800	OTTA		1206	1221	39 D	74			
	9400	HUAN	C	1206.5	1213	20.9	169.6	83.7		R
	8800	SGMR	3 S	1207	1212.7	56.3	158	63.3		2,SWF
	2695	SGMR	3 S	1207	1221.1	47	64.3	25.7		2,SWF
	8400	BERN	46 C	1207	1237.6	165	38	100		+8
	8900	BERN	46 C	1207	1237.6	165	40	108		+7
	10400	BERN	46 C	1207	1237.6	165	34	99		
	4995	SGMR	3 S	1207	1212.9	55	161	64.4		2,SWF
	9100	ARCE	46 C/F	1207	1213	34.2				
	9100	ARCE		1207	1213	12.6				
	3000	BERL	46 C	1207	1221	23	75			
	9500	BERL	4 S/F	1207	1212.5	21	147			
	8400	BERN	46 C	1207	1212.7	165	65	173		
	8900	BERN	46 C	1207	1212.7	165	64	172		
	10400	BERN	46 C	1207	1212.7	165	50	144		
	8400	BERN	46 C	1207	1217.5	165	40	106		
	8900	BERN	46 C	1207	1217.5	165	40	107		
	10400	BERN	46 C	1207	1217.5	165	28	81		
	8400	BERN	46 C	1207	1220.9	165	48	127		
	8900	BERN	46 C	1207	1220.9	165	45	125		
	10400	BERN	46 C	1207	1220.9	165	34	100		
	15000	KISV	45 C	1207	1212.8	20	72			
	2695	ATHN	4 S/F	1207.1	1213.1	38.3	61.8	18.5		
	8800	ATHN	4 S/F	1207.2	1210	51.4	311.2	93.4		
	4995	ATHN	4 S/F	1207.2	1213.2	49.7	244.5	73.4		
	1415	SGMR	20 GRF	1207.2	1236.6	45.4	64.9	26		2,SWF
	1415	ATHN	3 S	1207.4	1236.7	35.8	47.2	14.2		
	408	TRST	42 SER	1210.1	1212.8	8.2	51			
	237	TRST		1213.2	1324.3		615			38L
	237	TRST	47 GB	1213.2	1238.1	203	335			10L
	202	IZMI	25 R	1215	1232	95	420	130		
	9100	ARCE		1219.6	1221	10.6				
	930	BORD	42 SER	1221	1222.7	7	92	2		
	9400	HUAN	PBI	1227.4	1227.4	52.9	47.7	29.2		R
	9100	ARCE		1230.2	1237.7	11				
	1420	ARCE	40 F	1231.8	1238.8	8.5				
	1470	BERL	4 S/F	1232	1239	8	53			
	930	BORD	40 F	1233	1237.2	32	51	10		
	15000	KISV	4 S/F	1233	1237.8	8	55			
	9500	BERL	4 S/F	1236.3	1237.5	3.7	97			
	9400	HUAN	C	1236.4	1237.6	3.9	59.2	26		R
	3000	BERL	3 S	1236.5	1238	3.5	38			
	536	ONDR	45 C	1238	1239.5	2	98	23		
	9100	ARCE	29 PBI	1241.2		40				
	2800	OTTA	29 PBI	1245	1245	75	13.4	4.4		
	9400	HUAN	S	1253	1253.5	1.6	8.2	5.8		R
	2800	OTTA	20 GRF	1415	1515	100	2.6	1.3		
	9400	HUAN	S	1423.1	1424	2.2	16.5	7.8		0
	15400	SGMR	3 S	1423.9	1424.3	2.7	49.8	14.9		
	9100	ARCE	1 S	1424.1	1424.5	.6				
	9100	ARCE	29 PBI	1424.7		26.7				
	9400	HUAN	S	1540.2	1543.6	12.8	8.2	3		0
	9400	HUAN	S	1601.2	1614.5	19.4	9.9	5.8		0
	2800	OTTA	21 GRF	1625		275	17.8			
	8400	BERN	3 S	1630	1648.1	29	17	45		0
	10400	BERN	3 S	1630	1648.1	29	26	77		
	8400	BERN	3 S	1630	1640	29	7 U	19 U		0
	8900	BERN	3 S	1630	1640	29	7 U	19 U		0
	10400	BERN	3 S	1630	1640	29	6 U	19 U		
	8900	BERN	3 S	1630	1648.1	29	15	45		0
	9400	HUAN	S	1639.2	1639.8	2.1	26.3	4.7		R
	7000	SAOP	1 S	1639.3	1639.9	.8	6.1			
	7000	SAOP	41 F	1639.3						3
	7000	SAOP	4 S/F	1643.5	1644.2	.4	118	12		
	2695	ATHN	4 S/F	1646.1	1648.4	5.8	136	40.8		
	228	HARS	48 C	1646.7	1648	3.3	360	90		
	930	BORD	46 C	1647	1648	4	170	10		

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JUL 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	2695	BOUL	3 S	1647	1649	3.5	103	34		
	2800	OTTA	3 S	1647	1648.3	4	121	22		
	4995	BOUL	8 S	1647	1647.5	1.5	100	33		
	1420	BOUL	3 S	1647	1648.5	6.5	51	17		
	1415	ATHN	4 S/F	1647.5	1648.5	4	53.1	15.9		
	237	TRST	47 GB	1647.6	1648.3	1.5	390			D
	4995	ATHN	4 S/F	1647.6	1648.5	4.1	158.4	47.5		
	9100	ARCE	3 S	1647.8	1649.3	5.2				
	9400	HUAN	S	1647.8	1648	4.7	70.8	26.5		R
	606	SGMR	3 S	1647.8	1648.4	3.2	68.9	27.6		5,SWF
	8800	ATHN	4 S/F	1647.8	1648.4	3.8	97	29.1		
	245	SGMR	7 S	1647.9	1648.4	3.1	311	124		5,SWF
	410	SGMR	7 S	1647.9	1648.2	3.1	271	108		5,SWF
	1415	SGMR	3 S	1647.9	1648.5	3.1	59.2	23.7		5,SWF
	4995	SGMR	3 S	1648.8	1649.3	2.2	126	50.4		5,SWF
	2695	SGMR	3 S	1648.8	1649.2	2.2	140	56		5,SWF
	8800	SGMR	3 S	1648.9	1649.3	2.1	75	30		5,SWF
	15400	SGMR	3 S	1649	1649.1	2	44.7	17.9		5,SWF
	9400	HUAN	S	1659.5	1702.6	6.2	14.8	6.9		R
	7000	SAOP	46 C	1736	1830.2		1726	7		
	2800	OTTA	1 S	1737	1740	5	5.6	2.6		
	9400	HUAN	PRE	1737.2	1804	26.8	9.9	6.8		D
	237	TRST	41 F	1755.5	1756.1	.7	135			D
	2800	OTTA	4 S/F	1800.8	1801.2	1.2	12.8			
	2695	BOUL	8 S	1801	1801.5	1.5	14	5		
	15400	SGMR	47 GB	1803.5	1828.2	86.5	2020	810		4,SWF
	9400	HUAN	C	1804.1	1808.8	8.3	144.8	42.5		R
	8800	SGMR	47 GB	1805	1828.2	85	1660	660		4,SWF
	10400	BERN	3 S	1807.4	1809	9	37	108		
	4995	BOUL	4 SF	1807.5	1808.5	2.5	40	13		
	4995	SGMR	47 GB	1808.1	1828.2	81.9	560	220		4,SWF
	9100	ARCE	3 S	1808.5	1809.1	2.4				AT SUNSET
	930	BORD	46 C	1816	1822.8	36 D	816 D			SUNSET
	9400	HUAN		1816.5	1824.5		990.9			
	9400	HUAN		1816.5	1826		916.8			
	9400	HUAN		1816.5	1828.3		1723.4			
	9400	HUAN	C	1816.5	1822.1	35.1	900.3	432.1		R
	4995	BOUL	28 PRE	1817 E	1820 U	5.5	76	25		
	1420	BOUL	47 GB	1817.5	1820	74 D	515	172		
	2800	OTTA		1818	1819.8	6	130			
	2695	BOUL	45 C	1818	1829	69.5D	450	150		
	2800	OTTA	46F C	1818	1828.5	30	450	73		
	9100	ARCE	46 C/F	1818.3	1828.4	17.2				AT SUNSET
	9100	ARCE		1818.3	1819.2	2.6				ATMOSPHERIC SCI
	2695	SGMR	3 S	1819.4	1828.2	70.6	486	190		4,SWF
	1415	SGMR	47 GB	1820.1	1820.5	69.9	1210	480		4,SWF
	9100	ARCE		1820.9	1822.3	2.5				
	228	HARS	47 GB	1822	1834	90	480	50		
	4995	BOUL	47 GB	1822	1828.5	12 D	611	204		
	245	SGMR	49 GB	1822	1834	68	636	250		4,SWF
	410	SGMR	7 S	1822	1829	68	307	120		4,SWF
	606	SGMR	47 GB	1822.7	1828	67.3	745	300		4,SWF
	9100	ARCE		1823.4	1826.3	4.3				
	2800	OTTA		1824	1826	3.5	110			
	2800	OTTA		1827.5	1828.5	20.5	450			
	9100	ARCE		1827.7	1828.4	7.8				
	4995	BOUL	29 PBI	1834	1841 U	75 U	117	39		
	9100	ARCE	29 PBI	1835.5		15				
	9400	HUAN	PBI	1851.6	1851.6	33.4	49.4	21.1		D
	2800	OTTA	2 S/F	1852	1853.9	3	6.6	3.6		
	9400	HUAN	S	1912.1	1912.8	2.3	11.5	5.8		D
	9400	HUAN	S	1940.3	1951.2	17.5	6.6	2.8		D
	9400	HUAN	S	2010.3	2022.7	39.5	11.5	3.7		R
	9400	HUAN	S	2019.4	2020.5	2.8	34.6	13.2		R
	9400	HUAN	S	2107.4	2109	5.6	28	11.4		R
	9400	HUAN	S	2120.1	2122.3U	3.1	29.6	8.9		R
	1415	MANI	4 S/F	2243.2	2250.5	9.5	62.2	20.7		
10	4995	BOUL	4 SF	0059	0100.5	4	66	22		
	2695	PENT	1 S	0107	0108.3	5	6	3		
	35000	NAGO	21 GRF	0127	0152	150	44			
	35000	NAGO	5 S	0145	0145	1 E	50			
	1400	SYDN	1 S	0220.3	0221.4	2.3				
	15000	KISV	8 S	0455	0456.5	3	11			
	35000	NAGO	20 GRF	0517	0541	48	27			
	15000	KISV	3 S	0520	0523	5	68			
	2695	MANI	4 S/F	0520.9	0523.1	3.5	29.8	9.9		
	3100	CRIM	3 S	0521	0523.5	3	58	19		
	3100	CRIM	3 S	0521	0523.5	3	58	19		
	6100	KISV	7 C	0521	0522.3	4	91 D			
	2695	ATHN	3 S	0521.2	0523.3	3.1	35.9	10.8		
	8800	ATHN	4 S/F	0521.2	0523	3	106.4	31.9		
	8900	BERN	46 C	0521.3	0529.8	4	31	85		+9
	10400	BERN	46 C	0521.3	0529.8	4	28	83		
	8400	BERN	46 C	0521.3	0529.8	4	32	87		+13

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	200	HIRA	46 C	0521.5	0523	3	100	50		ML
	100	HIRA	46 C	0521.5	0523.2	3	1700	300		WL
	202	IZMI	41 F	0521.5	0523	4.2	100			
	1400	SYDN	45 C	0521.6	0522.2	2.9				
	4995	ATHN	4 S/F	0521.6	0523.1	2.7	95.5	28.6		
	1415	MANI	4 S/F	0521.7	0522.1	2.7	12.6	4.2		
	1415	ATHN	3 S	0521.8	0522.3	2.1	11.8	3.5		
	4995	MANI	4 S/F	0521.8	0523	2.6	44.4	14.8		IG
	700	SYDN	2 S	0522.7	0523.5	1.8				
	500	HIRA	3 S	0522.8	0523.4	2	70	30		SL
	606	MANI	4 S/F	0522.8	0523.7	1.3	22.6	7.5		
	15000	KISV	3 S	0532	0533	3	25			
	234	POTS	45 C	0550	0646	143	700	230		
	260	ONDR	44 NS	0552 E		562 D	61	5		
	127	TORN	44 NS	0630 E	1147.2	530 D	450	130		V=3
	200	HIRA	43 NS	0810		110 D	20	20		ML
	202	IZMI	43 NS	0815		225	60			
	410	SGHR	44 NS	0919 E	1654	898 D	31.5			
	245	SGHR	44 NS	0919 E	1837.8	898 D	379			
	240	KIEL	44 NS	1728	1734.5	30	800	80		
	200	HIRA	44 NS	1935 E	2210	860 D	40	10		MR
	10400	BERN	47 GB	0555	0642.4	115	2967 U	3900 U		
	8400	BERN	47 GB	0555	0642.4	115	556 D	1500 D		
	8900	BERN	47 GB	0555	0642.4	115	577 D	1500 D		
	6100	KISV	47 GB	0602	0645.3	59	4067			
	3100	CRIM	47 GB	0603	0614.7	60	560			
	3100	CRIM		0603	0628		270			
	3100	CRIM		0603	0626		390			
	3100	CRIM		0603	0617		480			
	3100	CRIM		0603	0637		210			
	3100	CRIM		0603	0622		400			
	3100	CRIM		0603	0628		270			
	3100	CRIM		0603	0626		390			
	3100	CRIM		0603	0617		480			
	3100	CRIM	47 GB	0603	0614.7	60	560			
	3100	CRIM	30 PBI	0603	0703	118	74			
	3100	CRIM		0603	0642.5		600			
	3100	CRIM		0603	0637		210			
	3100	CRIM		0603	0622		400			
	4995	ATHN	47 GB	0603.2	0645.4	73.2	9364	2809		
	2695	ATHN	47 GB	0603.2	0642.7	74.4	1952	586		
	8800	ATHN	47 GB	0603.2	0645.1	69.4	12206	3662		
	5730	IRKU		0603.5	0617.3		685 U			L
	5730	IRKU		0603.5U	0615		685 U			L
	5730	IRKU	47 GB	0603.5	0612.5	16	340			L
	4995	MANI	47 GB	0603.6	0644.9	59.9	1800	577.3		
	35000	NAGO	28 PRE	0605	0611	6	30			
	1415	ATHN	47 GB	0605.9	0628.9	70.4	1006	302		
	1415	ATHN	47 GB	0605.9	0644.8		1006	302		
	930	BORD		0609	0628		900			
	930	BORD		0609	0630		900			
	930	BORD		0609	0648		863			
	930	BORD		0609	0653		788			
	930	BORD		0609	0705		900			
	930	BORD	29 PBI	0609	0713	59	131	25		
	930	BORD	47 GB	0609	0645.5	62	1125	300		
	930	BORD		0609	0614.5		698			
	930	BORD		0609	0622.5		450			
	930	BORD		0609	0625		713			
	2695	MANI	47 GB	0609.8	0614.8	52.7	835	264.8		
	200	HIRA	48 C	0610	0648	118	1000	200		MLWR
	606	MANI	4 S/F	0610.5	0617.3	79.5	365.4	121.8		
	808	ONDR	49 GB	0610.5	0653	80	616	350		
	1415	MANI	4 S/F	0610.9	0626.7	79.8	460	149.3		
	35000	NAGO	47 GB	0611	0615	8	3140 D			
	500	HIRA	48 C	0611	0630.9	138	580	150		MLWR
	536	ONDR	49 GB	0612	0631	78	254	160		
	202	IZMI	46 C	0612.5	0648.2	47.5	1450	700		
	260	ONDR	49 GB	0612.7		116	216 D	182		
	228	HARS	47 GB	0613.5	0648 U	120	1600 D	200		
	237	TRST	47 GB	0615 E	0647.9	120 D	2450			65R
	100	HIRA	48 C	0617	0642.2	220 D	1500	200		WL
	35000	NAGO	30 PBI	0619	0621	22	190			
	5730	IRKU		0620	0631		35			L
	5730	IRKU		0620	0628		276			L
	5730	IRKU		0620	0625.7		550			L
	5730	IRKU		0620	0625.3		263			R
	5730	IRKU		0620	0622.2		240			R
	5730	IRKU	48 C	0620	0621	13	75			R
	113	POTS	45 C	0621 E	0642	92 D	700			
	35000	NAGO	5 S	0625	0626	4	591			
	9500	BERL	47 GB	0635 E	0642.5	65 D	7000 D			
	3000	BERL	47 GB	0635 E	0642.5	56 D	1275			
	1470	BERL	47 GB	0635 E	0643	60 D	1100			
	5730	IRKU		0635	0638.3		83			L

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	5730	IRKU	45 C	0635	0637	5	180			L
	5730	IRKU		0640.5	0646.5		2620 U			L
	5730	IRKU		0640.5	0644		2370			L
	5730	IRKU	47 GB	0640.5	0642.8	12	2500			L
	35000	NAGO	47 BGB	0641	0642	19	4360 D			
	5730	IRKU	29 PBI	0652		12	575			R
	202	IZMI	29 PBI	0700	0721.8	70	300	100		
	35000	NAGO	29 PBI	0700	0700	80 D	67			SUNSET
	3100	CRIM	3 S	0712	0714	4	35	12		
	3100	CRIM	3 S	0725	0728	4	35	12		
	808	ONDR	29 PBI	0730	0803.5	40	30	12		
	536	ONDR	29 PBI	0730	0757.6	60	65	19		
	1420	ARCE	21 GRF	0756.7	0804.3	10.5				
	1420	ARCE	4 S/F	0800	0801	2.5				
	1470	BERL	4 S/F	0800	0801	7.5	18			
	9100	ARCE	21 GRF	0802.5	0810.4	18				
	9100	ARCE	1 S	0802.5	0802.7	.5				
	9100	ARCE	21 GRF	0909.1	0940.1	86				
	15000	KISV	3 S	0920	0924	13	52 D			
	8400	BERN	3 S	0922.8	0923.8	12	11	30		O
	8900	BERN	3 S	0922.8	0923.8	12	11	31		O
	10400	BERN	3 S	0922.8	0923.8	12	14	42		
	9100	ARCE	3 S	0922.9	0924.1	4.8				
	9500	BERL	3 S	0923	0923.8	5	34			
	536	ONDR	21 GRF	0923	0934.5	22	14	6.8		
	8800	ATHN	3 S	0923.2	0924.1	3.1	37.2	11.2		
	6100	KISV	3 S	0923.3	0924	2	8			
	9100	ARCE	20 GRF	1030.5	1046.6	70				
	234	POTS	45 C	1205.6	1205.7	.4	200	70		
	3000	BERL	20 GRF	1214	1331.3	130	8.1			
	1470	BERL	20 GRF	1215	1352	165 D	3.2			
	7000	SAOP	21 GRF	1231.4						
	7000	SAOP	4 S/F	1231.4	1317.6		21	18		
	7000	SAOP	4 S/F	1231.4						
	9500	BERL	21 GRF	1234	1333	117	20			
	9100	ARCE	21 GRF	1236.2	1349.6	132				
	2800	OTTA	20 GRF	1240	1335	140	4.4	2.6		
	9100	ARCE	4 S/F	1303.1	1303.7	1.4				
	10400	BERN	46 C	1313.6	1317.6	97	21	62		
	8400	BERN	46 C	1313.6	1317.6	97	15	41		O
	8900	BERN	46 C	1313.6	1317.6	97	19	52		O
	6100	KISV	3 S	1314	1318	6	17			
	9400	HUAN	C	1315.3	1316.6	4.3	59.5	22		L
	9100	ARCE	4 S/F	1316.3	1317.8	3				
	4995	ATHN	3 S	1316.4	1318.1	24.1	23.9	7.2		
	8800	ATHN	4 S/F	1316.5	1317.9	17.2	50.2	15.1		
	9500	BERL	4 S/F	1316.7	1318	2.3	57			
	8800	SGMR	3 S	1316.7	1318.7	6.3	36.4	10.9		SWF
	9100	ARCE	29 PBI	1319.3		20				
	9400	HUAN	PBI	1319.6	1319.6	38.6	9.9	5.8		O
	10715	DWIN	45 C	1327	1328	8	70	20		
	2800	OTTA	21 GRF	1510	1600	135	5.2	2.4		
	9100	ARCE	21 GRF	1543.6	1548.7	58				
	8400	BERN	3 S	1548	1551.2	8	11	30		O
	10400	BERN	3 S	1548	1551.2	8	17	50		
	9400	HUAN	S	1548.6	1551.2	6.6	46.3	11.7		O
	15400	SGMR	3 S	1549.3	1551.2	4	45.9	13.8		SWF
	8800	ATHN	4 S/F	1549.7	1551.6	8.9	65.3	19.6		
	8800	SGMR	3 S	1549.9	1551.1	3.4	31.9	9.6		SWF
	9100	ARCE	3 S	1550	1551.3	5.2				
	4995	ATHN	3 S	1550.2	1551.6	7	10.2	3.1		
	2800	OTTA	1 S	1550.5	1551	1	1	.5		
	2695	ATHN	20 GRF	1551.3	1556.9	11.5	7.3	4.4		
	1415	ATHN	3 S	1551.8	1552.2	6.9	5.7	1.7		
	2800	OTTA	1 S	1555	1556.5	3	2	1		
	10715	DWIN	3 S	1600	1601	3	50	20		
	245	SGMR	7 S	1653.6	1654	1.7	360	144		
	237	TRST	41 F	1653.7	1653.9	1.4	545			5R
	7000	SAOP	46 C	1705	1730		112	6		7 COMPONENTS
	8400	BERN	45 C	1706.2	1707	12	15	39		O
	10400	BERN	45 C	1706.2	1707	12	33	98		
	9100	ARCE	45 C	1706.5	1707.1	3.8				
	8800	SGMR	3 S	1706.5	1706.9	11.5	75.6	30.2		
	15400	SGMR	3 S	1706.5	1707.1	11.5	142	56.8		3S
	9100	ARCE		1706.5	1707.1	1.9				
	8800	ATHN	4 S/F	1707.1	1707.4	12.2	85.3	25.6		
	4995	ATHN	1 F	1707.3	1712.7	12	20.5	10.2		
	9400	HUAN	C	1707.5E	1709 U	8.7	59.5	21.4		O
	9100	ARCE		1708.4	1709.1	1.9				
	2695	ATHN	3 S	1710.2	1712.8	5.4	11	6.6		
	9100	ARCE	30 PBI	1710.3		50 D				AT SUNSET
	9400	HUAN		1720.1	1734.2		90.9			
	9400	HUAN	C	1720.1	1730.1	37.3	196.7	49.3		LOR
	237	TRST	47 GB	1725.5	1734.5	35 D	14500			O
	4995	SGMR	45 C	1725.5	1734.3		82.4			4,SWF

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	4995	SGMR	45 C	1725.5	1730.2	27	93	33		4,SWF
	8400	BERN	45 C	1726.2	1730.1	44	25	66		0
	8800	SGMR	3 S	1726.2	1730.1	26.5	170	52.8		4,SWF
	10400	BERN	45 C	1726.2	1730.1	44	54	157		
	1415	SGMR	3 S	1726.5	1732.3	15.8	28	2.6		4,SWF
	15400	SGMR	3 S	1726.5	1730.2	26.8	310	136		4,SWF
	606	SGMR	3 S	1726.5	1732.1	13.5	190	7.5		4,SWF
	18	MCMA	41 F	1727	1736	56			3	
	9100	ARCE	4 S/F	1727.3	1730.2	4.2				ATMOSPHERIC SCI
	2695	SGMR	3 S	1727.5	1732.2	13.2	34	12.3		4,SWF
	405	KIEL	45 C	1728	1734.5	18	400	30		
	2800	OTTA	46F C	1728	1732	14	28.6	7.6		
	4995	BOUL	42 SER	1728	1733.5	72 D	90	30		
	245	SGMR	49 GB	1728.5	1734.4	25.5	11110	484		4,SWF
	410	SGMR	48 GB	1729.6	1735	9.4	620	329		4,SWF
	602	KIEL	45 C	1730	1734.5	9	300	70		
	800	KIEL	45 C	1731	1737.5	12	350	80		
	1420	KIEL	45 C	1731	1737	10	230	170		
	1420	BOUL	42 SER	1731	1737 U	105	17	6		
	9100	ARCE	29 PBI	1731.5		18				
	2800	OTTA	23 GRF	1750	1930	120	3.6			
	2695	SGMR	1 S	1819.9	1820.6	7.1	8.9	3.6		
	8800	SGMR	3 S	1820	1820.8	7	26.5	10.6		
	2800	OTTA	1 S	1820	1820.5	1	5.2	2.6		
	245	SGMR	48 GB	1820	1820.3	2	2480	992		
	4995	SGMR	3 S	1820	1820.6	7	40.3	16.1		
	1415	SGMR	3 S	1820	1825.7	10	27.4	11		
	9400	HUAN	S	1820.1	1820.8	1.7	49.6	15.5		R
	15400	SGMR	3 S	1820.2	1820.8	6.8	27	10.8		
	410	SGMR	6 S	1820.4	1820.7	1.1	28.1	11.2		
	8800	SGMR	21 GRF	1835	1836.3	515	18.9	7.6		
	1415	SGMR	20 GRF	1835	1840.5	515	13.5	5.4		
	606	SGMR	20 GRF	1835	1840.8	515	15.4	6.2		
	15400	SGMR	21 GRF	1835	1836.3	515	20.6	8.2		
	4995	SGMR	21 GRF	1835	1836.3	515	9	3.6		
	2695	SGMR	20 GRF	1835	1849.5	515	7.5	3		
	9400	HUAN	S	1835.5	1836.5	1.3	44.6	10.2		R
	9400	HUAN	S	1843.5	1921.6	74	36.3	23.1		0
	2800	OTTA	1 S	1848.5	1849	2	1.8	.9		
	9400	HUAN	S	1908.5	1908.8	2.1	64.4	21.5		0
	9400	HUAN	S	1915.6	1916.2	1	14.9	10.8		0
	2800	OTTA	1 S	1915.9	1916	1	3.2	1.4		
	2800	OTTA	23 GRF	2020	2225	250	4.6	2.2		
	9400	HUAN	S	2027.2	2052.1	55.1	29.7	17.7		0
	9400	HUAN	S	2029.3	2030.2	2.1	9.9	6.6		0
	9400	HUAN	S	2129.7	2146	28.4	11.6	6.4		0
	9400	HUAN	S	2134.2	2135.5	3.2	21.5	11.6		0
	35000	NAGO	21 GRF	2243	2249	40	15			
	8800	SGMR	3 S	2247.4	2248	2.6	91.4	36.6		
	15400	SGMR	3 S	2247.4	2248	2.6	213	85.2		
	4995	SGMR	3 S	2247.5	2248.1	2.5	21.6	8.6		
	4995	MANI	3 S	2247.9	2248	2	58.7	19.6		
	35000	NAGO	5 S	2248	2248	1 E	32			
	2695	PENT	1 S	2327.8	2328	2	9.2	2.8		
11	35000	NAGO	20 GRF	0039	0104	60	31			
	4995	BOUL	40 F	0122	0123	4.5D	17	6		
	1420	BOUL	4 SF	0122	0123	2.5D	18	6		
	200	HIRA	46 C	0122	0123	5	1700	200		0
	508	HIRA	46 C	0122.2	0123.5	6	220	40		WL
	700	SYDN	42 SER	0122.8	0123	4				
	1400	SYDN	4 S	0122.8	0123.4	1.6				
	2695	PENT	4 S/F	0122.9	0123	7	10	3.4		
	5730	IRKU		0301.3	0304.1		7			R
	5730	IRKU	45 C	0301.3	0302.4	4	15	5		R
	4995	MANI	41 F	0335.2	0337.4	28.3	81.4	27.1		IG
	508	HIRA	46 C	0335.3	0336.6	10.5	4000	200		WL
	606	MANI	4 S/F	0335.3	0336.9	3.6	175.7	58.6		
	700	SYDN	47 GB	0335.6	0337.5	4.4				
	5730	IRKU	2 S	0336.2	0337.4	3	63	13		L
	100	HIRA	46 C	0336.5	0337.5	3	8000	2000		0
	1400	SYDN	4 S	0336.6	0337.5	1.7				
	200	HIRA	46 C	0337	0338	3	1500	400		WL
	700	SYDN	45 C	0340.6	0340.8	1.6				
	700	SYDN	45 C	0344.7	0345	1.3				
	15000	KISV	45 C	0352	0400	8	283			
	8800	ATHN	4 S/F	0352.8	0353.4	3.4	76.4	22.9		
	4995	ATHN	3 S	0353	0353.7	2.4	39.6	11.9		
	6100	KISV	45 C	0357	0359.3	13	94			
	4995	ATHN	3 S	0358.8	0400.1	9.2	49.5	14.9		
	8800	ATHN	4 S/F	0359.4	0400.1	5.3	132.3	39.7		
	4995	MANI	47 GB	0422.2	0427.2U	26.8D	2350 D	739		IG PWR OUT
	6100	KISV	3 S	0423	0428	32	1235			
	4995	ATHN	47 GB	0423.2	0427.8	70.2	11560	3468		
	2695	ATHN	47 GB	0423.8	0428.2	69.5	1338	401.4		

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	15000	KISV	45 C	0425	0429	10	240			
	1420	KIEL	45 C	0426	0554	100	700	200		
	800	KIEL	45 C	0426	0540	99	400	110		
	35000	NAGO	5 S	0426	0428	6	70			
	1400	SYDN	4 S	0426.1	0427.9	10.4				
	1415	MANI	4 S/F	0426.3	0427.9U	21.1D	357.4D	115.9		R FAILURE
	8800	ATHN	47 GB	0426.5	0428.2	51.8	2250	675		
	780	SYDN	4 S	0426.6	0428.8	8.4				
	1415	ATHN	4 S/F	0426.7	0428.5	62.5	470	141		
	405	KIEL	45 C	0427	0504	142	90	60		
	602	KIEL	45 C	0427	0501.5	104	100	70		
	500	HIRA	46 C	0427.3	0429.6	10	50	20		0
	200	HIRA	46 C	0428	0428.8	20	1200	60		WL
	240	KIEL	45 C	0428	0429.5	94	2000	30		
	228	HARS	45 C	0428.7	0429	1.3	700 U	250		
	10400	BERN	45 C	0430 E	0430 E	6 D	16 D	50 D		
	35000	NAGO	29 PBI	0432	0432	54	21			
	100	HIRA	46 C	0433.7	0435.5	10	3500	500		WL
	1400	SYDN	4 S	0459.1	0502.3	10				
	700	SYDN	45 C	0459.3	0459.9	1.3				
	700	SYDN	45 C	0519.6	0520.9	4				
	10400	BERN	47 GB	0530	0543.1	85	285	828		
	8400	BERN	47 GB	0530	0543.1	85	247	656		+2
	260	ONDR	44 NS	0532 E		578 D	20			
	127	TORN	44 NS	0540 E		520 D		190		V=0
	410	SGMR	44 NS	0920 E	2006.6	897 D	313.3			
	245	SGMR	44 NS	0920 E	1906.4	897 D	301			
	100	HIRA	44 NS	1935 E	0020	860 D	130	50		ML
	200	HIRA	44 NS	1935 E	0520	860 D	40	20		SL
	808	ONDR	48 C	0532 E	0540.2	35	202	74		
	536	ONDR	41 F	0532 E	0539.5	46	25	8.9		
	15000	KISV	45 C	0535	0545	15	60 D			
	8800	ATHN	47 GB	0535.7	0543.8	37.6	960	288		
	6100	KISV	3 S	0538	0543	15	105			
	1415	ATHN	47 GB	0538.5	0555.3	41.5	2550	765		
	2695	ATHN	47 GB	0538.9	0554.4	24.5	1018	509		
	3100	CRIM	46 C	0539	0545.5	24	472	157		
	4995	MANI	3 S	0541	0543.3	5.7	59.7U	19.9U		AKING
	4995	ATHN	4 S/F	0542.3	0543.8	31	135.3	40.6		
	35000	NAGO	47 GB	0543	0543	3	890			
	35000	NAGO	29 PBI	0546	0550	120 D	30			SUNSET
	930	BORD	46 C	0602 E	0602 U	32 D	56 D			SUNRISE
	234	POTS	45 C	0634.8	0635.1	.4	200	70		
	237	TRST	41 F	0635	0635.1	.2	410			22L
	6100	KISV	20 GRF	0659	0705	29	16			
	10400	BERN	20 GRF	0700.1	0706.2	18	9	26		
	8400	BERN	20 GRF	0700.1	0706.2	18	9	24		0
	113	POTS	48 C	0701	0701.5	7.4	700	10		
	234	POTS	48 C	0702.5	0707.8	5.7	120	1		
	237	TRST	41 F	0707.8	0708	.3	320			15R
	113	POTS	45 C	0746.6	0746.8	.5	200	70		
	234	POTS	45 C	0746.6	0747	.8	260	85		
	8400	BERN	3 S	0820	0826.5	48	11	31		+12
	10400	BERN	3 S	0820	0826.5	48	12	35		
	8400	BERN	3 S	0820	0836.6	48	6 U	16 U		0
	10400	BERN	3 S	0820	0836.6	48	5 U	16 U		
	6100	KISV	8 S	0826	0827	2	44			
	3100	CRIM	1 S	0826	0827	2	11	4		
	15000	KISV	8 S	0826	0826.7	1	38			
	9100	ARCE	3 S	0826.4	0826.7	1				
	9500	BERL	3 S	0826.5	0826.7	.6	22			
	3000	BERL	3 S	0826.5	0826.9	1.5	8.1			
	6100	KISV	8 S	0836	0836.4	2	12			
	3100	CRIM	40 F	0902	1035	108	6	2		
	10400	BERN	45 C	0924.3	0935.7	29	58	169		
	8400	BERN	45 C	0924.3	0935.7	29	60	160		+12
	15000	KISV	3 S	0933	0936	5	90			
	6100	KISV	8 S	0934	0935.4	17	101			
	9500	BERL	4 S/F	0934	0936.2	19	146			
	8800	ATHN	4 S/F	0934.7	0935.8	4.7	198.5	59.6		
	4995	ATHN	3 S	0934.7	0935.7	4.2	49.5	14.9		
	9100	ARCE	4 S/F	0934.8	0935.9	9				RECORDDISTURBED
	3000	BERL	4 S/F	0935	0935.9	4	3.8			
	10715	DWIN	4 S	0935	0936	5	350	100		
	1420	ARCE	2 S/F	0935.4	0935.5	.5				
	8400	BERN	3 S	1004.8	1005.9	15	8	22		0
	10400	BERN	3 S	1004.8	1005.9	15	6	19		
	8400	BERN	47 GB	1028	1052.2	152	556 D	1500 D		
	10400	BERN	47 GB	1028	1052.2	152	2500 U	7500 U		
	2650	DWIN	4 S	1039	1043	5	100	20		
	15000	KISV	45 C	1043	1054	47	2090			
	15400	SGMR	47 GB	1043.4	1152.7		638			4,5,SWF
	15400	SGMR	47 GB	1043.4	1052.1	156.2	11500	3450		4,5,SWF
	15400	SGMR	47 GB	1043.4	1105.2		2760			4,5,SWF
	15400	SGMR	47 GB	1043.4	1121.3		1930			4,5,SWF

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	2695	SGMR	47 GB	1043.5	1053	155.2	4790	1437		4,5,SWF
	2695	SGMR	47 GB	1043.5	1105.3		1790			4,5,SWF
	2695	SGMR	47 GB	1043.5	1121.5		1760			4,5,SWF
	2695	SGMR	47 GB	1043.5	1154.6		1160			4,5,SWF
	9500	BERL	47 GB	1045	1052.5	145 D	7650 D			
	3000	BERL	47 GB	1045	1052.7	172 D	2520 D			
	6100	KISV	45 C	1045	1052.3	27	5910			
	4995	SGMR	47 GB	1047.7	1105.4		2850			4,5,SWF
	4995	SGMR	47 GB	1047.7	1153.8		1300			4,5,SWF
	4995	SGMR	47 GB	1047.7	1052.5	146.7	7700	2310		4,5,SWF
	4995	SGMR	47 GB	1047.7	1121.5		1890			4,5,SWF
	8800	SGMR	47 GB	1048	1052.4	142.5	18900	5670		4,5,SWF
	8800	SGMR	47 GB	1048	1121.5		1970			4,5,SWF
	8800	SGMR	47 GB	1048	1153.2		1260			4,5,SWF
	8800	SGMR	47 GB	1048	1105.4		5410			4,5,SWF
	9100	ARCE		1049.6		14.1				PEN 1020-1100UT
	9100	ARCE	47 GB	1049.6	1105.2	45.7				
	8800	ATHN	47 GB	1049.8	1052.4	219.4	2618.7	785.6		
	4995	ATHN	47 GB	1049.9	1052.4	225.9	1521.9	456.6		
	2695	ATHN	47 GB	1050	1052.4	246.2	5229.9	1568.9		
	35000	SGMR	47 GB	1050	1122.2		1547			4,5,SWF
	35000	SGMR	47 GB	1050	1152.8		468			4,5,SWF
	35000	SGMR	47 GB	1050	1052.2	141.8	12500	3750		4,5,SWF
	35000	SGMR	47 GB	1050	1105.4		1638			4,5,SWF
	930	BORD	47 GB	1050	1107 U	65	3280 D	800		
	10715	DWIN	49 GB	1050		105	800 D			
	2650	DWIN	49 GB	1050		120	180 D			
	2800	OTTA	47 GB	1050	1052.5	95	2800	370		
	1420	KIEL	47 GB	1050	1054	119	6000	500		
	602	KIEL	47 GB	1050	1052.5	120	210000	500		
	930	BORD		1050	1152.5		720			
	930	BORD	29 PBI	1050	1155	54.	200	60		
	930	BORD		1050	1220.5		200			
	930	BORD		1050	1235		140			
	930	BORD		1050	1247		160			
	930	BORD		1050	1055		3280			
	930	BORD		1050	1113		1240			
	930	BORD		1050	1117		3280			
	930	BORD		1050	1144.5		1040			
	3100	CRIM	47 GB	1050	1105.5	140 D	850	283		
	3100	CRIM		1050	1121.5		635	212		
	3100	CRIM		1050	1107		582	194		
	1420	ARCE	47 GB	1050.4		40.8				
	1420	ARCE		1050.4		12.5				
	1415	SGMR	47 GB	1050.5	1119.4		1230			4,5,SWF
	1415	SGMR	47 GB	1050.5	1154.3		306			4,5,SWF
	1415	SGMR	47 GB	1050.5	1054	126	2500	750		4,5,SWF
	1415	SGMR	47 GB	1050.5	1105.3		1450			4,5,SWF
	1470	BERL	47 GB	1051	1054.4	119	2260 D			
	800	KIEL	47 GB	1051	1106.5	119	15000	400		
	808	ONDR	49 GB	1051		117	626 D	395		
	606	SGMR	47 GB	1051.5	1117.3		9280			4,5,SWF
	536	ONDR	49 GB	1051.5		116	429 D	285		
	606	SGMR	47 GB	1051.5	1144.8		2320			4,5,SWF
	606	SGMR	47 GB	1051.5	1053.1	127	48100 1	4430		4,5,SWF
	606	SGMR	47 GB	1051.5	1106.2		10300			4,5,SWF
	234	POTS	45 C	1051.5	1145	250 D	5300			
	1415	ATHN	47 GB	1051.6	1053.7	235.1	3492.9	1047.9		
	410	SGMR	49 GB	1051.8	1053.6	124.3	252000 7	5600		4,5,SWF
	410	SGMR	49 GB	1051.8	1106.7		6600			4,5,SWF
	410	SGMR	49 GB	1051.8	1123.8		3350			4,5,SWF
	410	SGMR	49 GB	1051.8	1145.1		1720			4,5,SWF
	408	TRST	48 C	1051.9	1052.2	.6	160			
	113	POTS	45 C	1052	1101.5	250 D	1400			
	240	KIEL	47 GB	1052	1054 U	120	10000 D			
	405	KIEL	47 GB	1052	1054	119	50000	200		
	245	SGMR	49 GB	1052.5	1122.1		4770			4,5,SWF
	260	ONDR	49 GB	1052.5		115	219 D	153		
	245	SGMR	49 GB	1052.5	1145.4		7360			4,5,SWF
	245	SGMR	49 GB	1052.5	1053.3	125.5	12400	3720		4,5,SWF
	245	SGMR	49 GB	1052.5	1105.4		2280			4,5,SWF
	408	TRST	49 GB	1052.5	1106.7	20.8	1600			
	228	HARS	47 GB	1052.7	1053 U	65	8000 D	1100		
	228	HARS		1052.7	1058		4300			
	228	HARS		1052.7	1105.5		2700			
	228	HARS		1052.7	1117		3900			
	228	HARS		1052.7	1122		4400			
	127	TORN	25 R	1052.8	1058 D	15 U	1300 D			INCOMPLETE
	237	TRST	47 GB	1052.9	1053.1	130 D	17500			20R
	237	TRST		1052.9	1057.4		10500			0
	237	TRST		1052.9	1103.9		5500			0
	237	TRST		1052.9	1122		5600			40L
	237	TRST		1052.9	1145.1		8000			86L
	202	IZMI	46 C	1053.5	1054	76.7	3000	500		
	202	IZMI	47 GB	1053.5	1054	1.5	3000	1200		

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	202	IZMI	48 C	1055	1102	18	2200	1000		
	1420	ARCE		1102.9	1105.2	10.1				
	18	HOMA	42 SER	1103	1200	57			2	
	9100	ARCE		1103.7	1105.2	12.4				
	1420	ARCE		1113	1119.2	18.2				
	202	IZMI	48 C	1113	1121.5	31	2400	1400		
	408	TRST	49 GB	1113.3	1123.6	16.5	1600			
	6100	KISV	47 GB	1116	1122	14	1668			
	9100	ARCE		1116.1	1121.3	19.2				
	1420	ARCE	30 PBI	1131.2		80				
	1420	ARCE	46 C/F	1135	1154.5	44				
	1420	ARCE		1135	1141.7	9.3				
	408	TRST	49 GB	1135.2	1139.4	9.3	1000			
	9100	ARCE	30 PBI	1135.3		180				
	9400	HUAN	C	1142 E	1152.8U	35.1	886.8	391.6		R
	202	IZMI	47 GB	1144	1144.5	11	2300	1300		
	1420	ARCE		1144.3	1144.8	6.1				
	408	TRST	49 GB	1144.5	1145.7	13.4	1400 D			
	228	HARS		1144.8	1145.5		4600 D			
	9100	ARCE	4 S/F	1144.8	1153.8	36				
	6100	KISV	47 GB	1148	1154	37	1842			
	1420	ARCE		1150.4	1154.5	28.6				
	7000	SAOP	46 C	1153.4E	1153.4		16029	14		STAR BEFORE OBS
	408	TRST	49 GB	1216.9	1223	12	520			
	9400	HUAN	PBI	1217.1	1217.1	60.2	52.6	14.9		R
	202	IZMI	3 S	1220	1222.3	5	390	240		
	2800	OTTA	30 PBI	1225	1225	365	15.8	7.9		
	6100	KISV	3 S	1233	1247.5	22	32			
	408	TRST	48 C	1237.9	1239.6	1.9	1600			
	202	IZMI	41 F	1238	1247.5	10.2	700			
	2800	OTTA	1 S	1238.5	1239	3.5	3.2	1.6		
	2800	OTTA	3 S	1246	1247.1	3	12	3		
	1420	BOUL	8 S	1246	1246.5	1.5	7	2		
	9400	HUAN	S	1246.7	1247.1	1	11.5	5.7		0
	408	TRST	48 C	1246.8	1247.2	1.3	780			
	2800	OTTA	1 S	1312	1313	4	2.2	1.1		
	2800	OTTA	8 S	1351.9	1352	.7	5	1.7		
	2695	PENT	1 S	1416	1418	5	4.2	2		
	7000	SAOP	4 S/F	1452.3						END 1638.6
	606	SGMR	3 S	1609	1613.1	24	1218	487.2		4,5
	1420	BOUL	3 S	1610.5	1612.5	2.5D	23	8		
	1415	SGMR	3 S	1611	1612.7	9	37.8	15.1		4,5
	930	BORD	42 SER	1611	1626.3	19	232	6		
	4995	BOUL	4 SF	1611	1612.5U	3.5	207	69		
	2800	OTTA	4 S/F	1611	1612.5	3	110	38		
	2695	SGMR	3 S	1611	1612.7	3	129.9	52		4,5
	245	SGMR	49 GB	1611	1613	22.1	131.4	474.2		4,5
	245	SGMR	49 GB	1611	1623.8		1185.5			4,5
	410	SGMR	7 C	1611	1612.6	21	118.4	47.4		4,5
	410	SGMR	7 C	1611	1624		54.4			4,5
	2650	OWIN	3 S	1611	1612	2	110	30		
	10715	OWIN	3 S	1611	1612	2	250	50		
	1420	ARCE	4 S/F	1611.2	1612.5	2.4				
	10400	BERN	4 S/F	1611.2	1612.7	26	74	216		
	9400	HUAN	S	1611.3	1612.6	4.1	249.6	90		R
	1415	ATHN	3 S	1611.3	1612.8	2.8	18.4	5.5		
	4995	SGMR	3 S	1611.5	1612.5	2.5	236.4	94.6		4,5
	8800	SGMR	3 S	1611.7	1612.5	3.3	276.9	110.8		4,5
	2695	ATHN	4 S/F	1611.7	1612.7	2.3	105.3	31.6		
	4995	ATHN	4 S/F	1611.9	1612.8	18.5	291.9	87.6		
	15400	SGMR	3 S	1612	1612.7	4	168	67.2		4,5
	2695	BOUL	4 SF	1612	1613.5	2.5	108	36		
	9100	ARCE	3 S	1612	1612.8	3.2				
	8800	ATHN	4 S/F	1612.1	1612.8	20.9	413.7	124.1		
	237	TRST	47 GB	1612.2	1623.8	12.7	710			1L
	9400	HUAN	PBI	1615.4	1615.4	20.2	24.6	7.1		0
	2800	OTTA	2 S/F	1617	1618.5	2	7.2	3.4		
	7000	SAOP	4 S/F	1638.7	1648.9	3.2	33.5			
	10400	BERN	4 S/F	1647	1648.7	17	15	45		
	9400	HUAN	S	1647.4	1648.5	11.3	47.6	15		R
	9100	ARCE	3 S	1647.9	1648	8				
	245	SGMR	7 S	1658.5	1659.1	1.5	350	140		
	2800	OTTA	1 S	1658.5	1659	1	7.2	3.6		
	930	BORD	46 C	1658.6	1659.1	1	88	7		
	237	TRST	47 GB	1658.7	1659.1	11.5	920			5R
	606	SGMR	3 S	1658.8	1659.2	.8	485.1	194		
	1415	SGMR	1 S	1658.9	1659.2	1.1	4.2	1.7		
	410	SGMR	6 S	1659	1659.2	.8	99.9	40		
	930	BORD	41 F	1727.3	1727.3	.6	16	1		
	9400	HUAN	S	1730.3	1731.4	2	6.6	4.2		0
	930	BORD	41 F	1824	1824.2	.8	16	3		
	606	SGMR	3 S	1841	1841.4	1	221	88.4		
	930	BORD	41 F	1841	1841.2	.5	256	20		
	245	SGMR	6 S	1842	1842.8	1	215.8	86.3		
	1415	SGMR	3 S	1842.4	1842.8	.6	21.6	8.6		

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	410	SGMR	6 S	1842.6	1842.8	.4	150	60		
	2800	OTTA	8 S	1842.9	1842.9	.1	9.4			
	9400	HUAN	S	2021	2022.5	6.5	16.4	10.4		O
	606	SGMR	3 S	2031	2031.9	4	156.2	62.5		
	9400	HUAN	S	2031.1	2033.1	6.4	21.3	8.2		O
	1415	SGMR	1 S	2031.5	2031.8	4.5	3.8	1.5		
	500	HIRA	46 C	2031.6	2032.4	3	90	20		SL
	700	SYDN	45 C	2205.2	2208.4	8.1				
	2695	PENT	23 GRF	2215	2231	210	8.2	4.1		
	4995	MANI	4 S/F	2220.4	2227.5	16.7	249.7	83.3		
	4995	SGMR	3 S	2225	2227.4	10	211.5	84.6		
	4995	BOUL	45 C	2225	2227.5U	13.5D	240	80		
	8800	SGMR	47 GB	2225	2230.7	12	831.6	332.6		
	9400	HUAN	S	2226	2226.8U	1.2	180.6	53.1		R
	2695	SGMR	3 S	2226	2227.6	4	29.6	11.8		
	1420	BOUL	4 SF	2226.5	2227.5	3.5D	57	19		
	2695	MANI	4 S/F	2226.6	2227.5	1.1	73.7	24.7		
	2800	OTTA	3 S	2226.7	2227.5	2	25.8	12.9		
	1415	MANI	4 S/F	2226.9	2227.3	1.1	39	13		
	15400	SGMR	47 GB	2227	2230.7	10	2595	1038		
	1415	SGMR	3 S	2227	2227.4	2	111.4	44.6		
	1400	SYDN	45 C	2227	2227.3	1.5				
	35000	SGMR	47 GB	2227.5	2230.6	7.5	2895	1158		
	35000	NAGO	47 GB	2228	2230	7	1470			
	2695	BOUL	3 S	2228	2229	2.5D	25	8		
	35000	NAGO	29 PBI	2235	2236	70	29			
	2695	PENT	8 S	2358	2358	.1	2.4			
	2695	PENT	8 S	2359	2359	.1	6			
	2695	PENT	3 S	2413	2413.1	2	44	11		
	2695	PENT	8 S	2420.1	2420.5	.5	4.2	2.1		
	2695	PENT	8 S	2448.8	2448.8	.1	5.4			
12	35000	NAGO	20 GRF	0001	0020	39	15			
	1415	MANI	22 GRF	0011.8	0013.2	11	48.8	16.3		
	2695	MANI	3 S	0012.9	0013.1	2.1	132.6	44.2		
	606	MANI	41 F	0012.9	0013	13.3	265.3	88.4		
	4995	MANI	41 F	0013	0013.1	9.3	46.6	15.5		
	700	SYDN	8 S	0020.2	0020.5	.5				
	100	HIRA	42 SER	0044	0048.5	5	15000			WL
	1400	SYDN	8 S	0046	0046.2	1				
	500	HIRA	46 C	0046.3	0047.3	2	240	60		WL
	700	SYDN	45 C	0046.3	0047.2	2.7				
	606	MANI	4 S/F	0047.1	0047.3	1.2	56.5	18.8		IG
	1400	SYDN	45 C	0052.3	0053.8	2.1				
	700	SYDN	1 S	0055.5	0055.8	.6				
	1400	SYDN	1 S	0055.6	0055.8	.4				
	1415	MANI	4 S/F	0055.8	0059.4	3.9	92.7	30.9		IG
	35000	NAGO	21 GRF	0220	0301	92 D	33			
	5730	IRKU	1 S	0242	0242.9	2	29	8		L
	4995	MANI	40 F	0248	0251	4.8	23.2	7.7		
	35000	NAGO	5 S	0255	0255	3	250			
	5730	IRKU	1 S	0255.3	0255.8	3	29	10		L
	700	SYDN	45 C	0303.8	0304.4	1.3				
	202	IZMI	44 NS	0500		428	60			
	260	ONDR	44 NS	0526 E		587 D	94			
	536	ONDR	43 NS	0556	0558.5	548	104			
	127	TORN	44 NS	0640 E	1208.2	520 D	1200	22		V=3
	418	SGMR	44 NS	0921 E	1000.3	895 D	44.5			3,5,CONT
	245	SGMR	44 NS	0921 E	1448.2	895 D	440			3,5,CONT
	100	HIRA	44 NS	2100 E	0230	480 D	150	65		
	808	ONDR	2 S/F	0558.3	0558.7	1	30	2		
	3100	CRIM	25 R	0715	1140		12			
	8900	BERN	20 GRF	0724.1	0726.7	5	5	14		O
	10400	BERN	20 GRF	0724.1	0726.7	5	7	21		
	113	POTS	48 C	0735.7	0736.2	13	500	1		
	6100	KISV	8 S	0806	0809.5	9	13			
	10400	BERN	20 GRF	0807.3	0809.4	2.5	4	13		
	8900	BERN	20 GRF	0807.3	0809.4	2.5	6	17		+15
	9100	ARCE	20 GRF	0809.1	0809.6	11.2				
	6100	KISV	42 SER	0855	0921.5	45	45			
	9100	ARCE	20 GRF	0900.1	0907.9	18				
	10400	BERN	20 GRF	0901.6	0907.6	50	8	23		
	8900	BERN	3 S	0901.6	0921.6	50	21	58		+11
	10400	BERN	3 S	0901.6	0921.6	50	21	61		
	8900	BERN	20 GRF	0901.6	0907.6	50	10	27		+3
	1420	ARCE	40 F	0902.8	0905.8	12				
	1470	BERL	40 F	0903	0906	12	13			
	9500	BERL	20 GRF	0903	0908	7	23			
	3000	BERL	40 F	0905	0906	10	8.5			
	3100	CRIM	1 S	0906	0909	3.5	10	3		
	3100	CRIM	1 S	0913.6	0913.7	.4	12	4		
	9500	BERL	4 S/F	0921	0921.6	5	47			
	8800	ATHN	4 S/F	0921	0921.7	4.9	50.9	15.3		
	4995	ATHN	3 S	0921.2	0924.7	3.8	17	5.1		
	9100	ARCE	3 S	0921.2	0921.8	1.2				

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	9100	ARCE	29 PBI	0922.4		6.8				
	113	POTS	48 C	0934.5	0959.5	46	2100	5		
	234	POTS	48 C	0936.3	1010.1	41	200	1		
	237	TRST	41 F	0936.6	0936.8	.4	370			4R
	930	BORD	41 F	0959.4	1000.3	1	38	2		
	237	TRST	42 SER	1005.6	1010.2	3.7	235			5L
	10400	BERN	45 C	1011.9	1019.3	27	8	25		
	8900	BERN	45 C	1011.9	1016.7	27	9	24		+3
	6100	KISV	21 GRF	1012	1014	26	26			
	9500	BERL	20 GRF	1012.5	1019.5	21	21			
	9100	ARCE	22 GRF	1012.7	1019.5	30				
	1420	ARCE	1 S	1019.7	1019.8	.4				
	237	TRST	5 S	1031.7	1031.8	.1	300	97		0
	2800	OTTA	1 S	1050	1050.9	2	3	1.4		
	408	TRST	42 SER	1054.3	1058.1	3.8	20			
	7000	SAOP	22 GRF	1116.5	1327.8		34	18		2 COMPONENTS
	6100	KISV	42 SER	1140	1211	50	15			
	8900	BERN	20 GRF	1144	1206.6	40	7	18		0
	10400	BERN	20 GRF	1144	1206.6	40	7	20		
	1420	ARCE	1 S	1145	1145.3	.8				
	2800	OTTA	1 S	1145.5	1146	1	1.6	1		
	9100	ARCE	2 S/F	1145.8	1146.1	1				
	808	ONDR	45 C	1157.7	1157.7	1.5	40			
	237	TRST	42 SER	1207.9	1210.3	4.9	5200			0
	260	ONDR	46 C	1208.2	1209.2	5	216 D	25		
	113	POTS	45 C	1208.3	1210.3	3.7	800	70		
	234	POTS	2 S/F	1208.5	1210.5	5.5	3400	250		
	245	SGMR	48 GB	1208.5	1210.4	5.4	3800	1140		5
	9100	ARCE	40 F	1208.7	1210.6	5.6				
	1420	ARCE	40 F	1208.8	1210.7	3.4				
	408	TRST	42 SER	1209.2	1209.2	1.6	19			
	2800	OTTA	1 S	1210	1210.8	3.5	1.6	.7		
	9400	HUAN	S	1210.1	1210.5	1.5	17.4	8.9		0
	234	POTS	45 C	1238	1238.2	.7	140	30		
	113	POTS	45 C	1238	1238.2	.7	100	25		
	237	TRST	41 F	1238.1	1238.4	.5	610			25R
	113	POTS	48 C	1301	1301.5	6.6	1800	10		
	2800	OTTA	1 S	1301.5	1302.7	3.5	3.4	1.2		
	234	POTS	48 C	1302.6	1307.1	4.9	140 E	1		
	808	ONDR	8 S	1302.6	1302.6	.3	65			
	237	TRST	41 F	1306.9	1307.2	.6	770			9R
	6100	KISV	42 SER	1308	1326	58	26			
	9500	BERL	20 GRF	1310	1331	50	23			
	3000	BERL	21 GRF	1310	1336	50	10			
	2800	OTTA	21 GRF	1310	1334	125	7.2	3		
	237	TRST	41 F	1317.2	1319.3	2.8	340			7R
	1470	BERL	21 GRF	1318	1336	42	3.2			
	113	POTS	45 C	1319.3	1319.5	.7	400	40		
	2800	OTTA	1 S	1320.5	1321	2	2.8	1.4		
	9400	HUAN	S	1320.5	1330.5	45.7	25.3	10.3		R
	10400	BERN	20 GRF	1324	1325	24	3 U	10 U		
	4995	ATHN	20 GRF	1324	1329.2	19.1	10.4	6.2		
	8900	BERN	20 GRF	1324	1325	24	4	13		0
	8800	ATHN	20 GRF	1324.2	1326.5	16.7	15.7	9.4		
	2800	OTTA	8 S	1335.7	1336	.7	1.8	1		
	237	TRST	41 F	1337	1337.2	.3	1100			5R
	808	ONDR	41 F	1349.5	1349.5	7	28	2		
	4995	BOUL	4 SF	1351.5	1353	3.5	17	6		
	2800	OTTA	4 S/F	1352	1353.6	6	10.2	4		
	1420	ARCE	4 S/F	1352.1	1353.5	6				REC DIS 9100MHZ
	4995	SGMR	3 S	1352.2	1354.2	4.8	11.7	4.7		
	1415	SGMR	3 S	1352.3	1353.6	3.7	11	4.4		
	2695	SGMR	3 S	1352.4	1354.6	6.1	22	8.8		
	3000	BERL	4 S/F	1353	1353.5	3.5	13			
	1470	BERL	4 S/F	1353	1353.6	4	9			
	1420	BOUL	2 SF	1353	1353.5	2	6	2		
	606	SGMR	3 S	1353.4	1353.5	1.6	13.9	5.6		
	9100	ARCE	22 GRF	1434.3	1449	35				
	234	POTS	48 C	1449.3	1457	8.9	350	10		
	113	POTS	48 C	1451.2	1455.6	7	1400	15		
	237	TRST	41 F	1456.5	1458	2	600 D			7L
	1420	ARCE	2 S/F	1457.7	1457.9	.8				
	2650	DWIN	45 C	1500	1506	10	115	20		
	10715	DWIN	45 C	1500	1506	10	700	100		
	7000	SAOP	46 C	1521	1605.6		886	23		2 COMPONENTS
	1420	ARCE	40 F	1541.1	1542	2				
	2800	OTTA	23 GRF	1550	1840	310	10.4	5.5		
	4995	BOUL	45 C	1558.5	1601	4	74	25		
	1420	ARCE	40 F	1558.8	1559.1	3.5				REC DIS 9100MHZ
	9400	HUAN	S	1559	1605.7	8.6	248.6	58.5		R
	1420	BOUL	45 C	1559	1600	3	90	30		
	2800	OTTA	4 S/F	1559.5	1600.7	5	15.2	7.4		
	1415	SGMR	45 C	1559.5	1600.3	10.5	156	47.9		3G,SWF
	1415	SGMR	45 C	1559.5	1605.8		52.9			3G,SWF
	2695	SGMR	3 S	1559.7	1605.8	10.3	149	47		3G,SWF

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	4995	SGMR	3 S	1559.7	1605.8	10.3	435	131		3G,SWF
	2695	ATHN	4 S/F	1559.9	1605.7	13.8	126	37.8		
	410	SGMR	48 GB	1600	1605.4		658			3G,SWF
	1415	ATHN	4 S/F	1600	1600.2	9.1	79.6	23.9		
	35000	SGMR	47 GB	1600	1606.7	9	975	293		3G,SWF
	15400	SGMR	47 GB	1600	1606.7	10	832	190		3G,SWF
	410	SGMR	48 GB	1600	1600.3	7.5	195	197		3G,SWF
	8800	SGMR	47 GB	1600	1605.8	10	761	228		3G,SWF
	8800	ATHN	4 S/F	1600	1605.8	23.9	1368.4	410.5		
	4995	ATHN	4 S/F	1600	1605.8	16.8	607.4	182.2		
	10400	BERN	47 GB	1600.1	1605.7	45	250	736		
	10400	BERN	20 GRF	1600.1	1601.9	45	20	60		
	2695	BOUL	45 C	1600.5	1603	4	16	5		
	245	SGMR	48 GB	1600.5	1600.8	9.5	3760 O	1128 O		3G,SWF
	245	SGMR	48 GB	1600.5	1605.7		158			3G,SWF
	237	TRST	41 F	1601.5	1601.8	.8	46000			O
	606	SGMR	3 S	1601.5	1603.7	7.5	109	32.7		3G,SWF
	4995	BOUL	4 SF	1604	1606	4 D	371	124		
	1420	ARCE	4 S/F	1604.2	1605	2.4				
	1420	BOUL	3 S	1604.5	1606	5.5	43	14		
	2800	OTTA	3 S	1605	1605.9	5	118	28.2		
	9100	ARCE	4 S/F	1605.1	1605.8	3.7				RECORDDISTURBED
	2695	BOUL	3 S	1606	1606.5	5 D	117	39		
	1420	ARCE	29 PBI	1606.6		30				
	9400	HUAN	PBI	1607.6	1607.6	32	42.8	23.2		R
	9100	ARCE	29 PBI	1608.8		54				
	2800	OTTA	8 S	1658	1658.2	.5	6.4			
	7000	SAOP	4 S/F	1733.5	1800	.2	195.3	2		
	9400	HUAN	S	1751.8	1759.7	19.9	224.8	61.9		O
	4995	BOUL	4 SF	1758.5	1759	2	50	17		
	10400	BERN	46 C	1759	1800	16 D	98	284		
	1420	BOUL	8 S	1759	1759.5	1.5	11	4		
	245	SGMR	48 GB	1759.2	1800.3	3.8	5970	2388		3G
	237	TRST	41 F	1759.2	1800.1	1	8500			O
	15400	SGMR	3 S	1759.5	1800	2.5	368	147		3G
	606	SGMR	3 S	1759.5	1759.7	2	55.9	22.4		3G
	8800	SGMR	3 S	1759.5	1800	2.5	284	113		3G
	35000	SGMR	3 S	1759.5	1800	1.5	339	135		3G
	4995	SGMR	3 S	1759.6	1800	2.4	53.5	21.4		3G
	1415	SGMR	3 S	1759.7	1800.1	1.8	19.1	7.6		3G
	2695	SGMR	1 S	1759.7	1800	1.3	4.2	1.7		3G
	9100	ARCE	3 S	1759.7	1800.1	2				AT SUNSET
	410	SGMR	7 S	1759.7	1800.3	2.3	482	193		3G
	2800	OTTA	1 S	1759.9	1800	1	6.4			
	9400	HUAN	S	1825.8	1836.7	30.2	19	8.5		O
	100	HIRA	46 C	1935 E	2020	85 D	300	150		
	4995	BOUL	45 C	2048	2050.5	4	44	15		
	1420	BOUL	45 C	2048	2051	3.5	7	2		
	4995	SGMR	3 S	2048.3	2055	11.7	59.1	23.6		CONT,SWF
	200	HIRA	41 F	2048.5	2049.5	8	250			WL
	1415	SGMR	20 GRF	2048.5	2051.2	11.5	6.1	2.4		CONT,SWF
	2800	OTTA	46F C	2049	2051	4	25.2	11.4		
	9400	HUAN	C	2049	2054.7	19.7	274.4	37.8		R
	8800	SGMR	3 S	2049	2055	11	347	139		CONT,SWF
	15400	SGMR	3 S	2049	2054.9	11	473	189		CONT,SWF
	2695	BOUL	2 SF	2050	2050.5U	1 D	16	5		
	2695	SGMR	3 S	2050.1	2051.1	9.9	22	8.8		CONT,SWF
	2695	BOUL	45 C	2051.5	2052	3.5D	16	5		
	4995	BOUL	8 S	2053	2054.5	1.5	50	17		
	1420	BOUL	1 S	2053	2053.5	1	2	1		
	1420	BOUL	45 C	2116.5	2117.5	2.5	6	2		
	4995	BOUL	4 SF	2116.5	2117	2	60	20		
	2800	OTTA	3 S	2117.1	2117.5	2	18	9		
	9400	HUAN	S	2117.1	2117.3	6.2	51.6	11		R
	2695	BOUL	4 SF	2118	2118.5U	2 D	16	5		
	9400	HUAN	S	2143.4	2149.3	12.8	16.6	6.5		R
	700	SYDN	8 S	2225.7	2225.8	.3				
	1400	SYDN	45 C	2226.5	2226.6	1.2				
13	4995	BOUL	4 SF	0012	0012.5	2	43	14		
	1420	BOUL	4 SF	0012.5	0013	2	14	5		
	100	HIRA	7 C	0019	0019.8	1.5	30000	9999.9		ML
	200	HIRA	7 C	0019	0019.8	1.5	120	100		WR
	1415	MANI	1 S	0019.2	0019.4	.5	3	1.2		
	2695	MANI	3 S	0019.2	0019.4	1	19.7	6.5		
	4995	MANI	3 S	0019.2	0019.6	2.4	10.5	3.5		I
	606	MANI	3 S	0019.3	0019.5	1	12.1	4		
	2695	PENT	8 S	0019.7	0019.7	.2	7.6			
	1420	BOUL	40 F	0046.5	0053.5	12 D	11	4		
	1420	BOUL	1 S	0100.5	0101	1.5	7	2		
	1400	SYDN	2 S	0101.5	0101.6	.5				
	8900	BERN	1 S	0538.5	0540.9	15	8	23		O
	10400	BERN	1 S	0538.5	0540.9	15	9	28		
	260	ONDR	44 NS	0600 E		550 D	162			
	410	SGMR	44 NS	0922 E	1627.8	894 D	31.5			3

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JUL 1978	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	POLARIZATION OR REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	245	SGMR	44 NS	0922 E	2024.3	894 D	25.3			3
	10400	BERN	46 C	0624.7	0625.3	6	6	19		
	8900	BERN	46 C	0624.7	0625.3	6	7	20		0
	234	POTS	1 S	0733.9	0734	1	175	60		
	113	POTS	1 S	0733.9	0734	.2	210	70		
	237	TRST	41 F	0734	0734	.2	285			0
	127	TORN	2 S/F	0738	0742	10	9.6	4.8		
	6100	KISV	21 GRF	0739	0744	17	15			
	10400	BERN	20 GRF	0741.5	0743.9	17	4	13		
	8900	BERN	20 GRF	0741.5	0743.9	17	6	16		0
	9100	ARCE	2 S/F	0743	0744.3	7				
	113	POTS	1 S	0811	0811.1	.6	120	40		
	234	POTS	1 S	0811	0811.1	1.1	1000	300		
	202	IZMI	8 S	0811	0811.2	.5	1200	550		
	8900	BERN	46 C	0811.2	0811.5	3.5	5	15		0
	237	TRST	41 F	0811.2E	0811.2	.20	1400			3L
	10400	BERN	46 C	0811.2	0811.5	3.5	5	15		
	9100	ARCE	1 S	0811.3	0812.2	3.8				
	8900	BERN	22 GRF	0832.2	0833	4.5	5	15		0
	10400	BERN	22 GRF	0832.2	0833	4.5	4	13		
	9100	ARCE	1 S	0832.8	0834.2	5				
	1420	ARCE	4 S/F	0836.7	0836.9	.9				
	808	ONDR	3 S	0837	0837	.3	50			
	9100	ARCE	40 F	0901.5	0902.1	3				
	6100	KISV	8 S	0912	0913.5	3	9			
	6100	KISV	42 SER	0945	1017	58	10			
	1420	ARCE	40 F	0955.9	0956.2	4.8				
	1470	BERL	42 SER	0955.9	0956.3	12	11			
	930	BORD	41 F	0956	0956.4	4.3	30	3		
	113	POTS	45 C	0959.4	1000	1	250	7		
	8400	BERN	1 S	1013.2	1016.6	10	7	20		0
	8900	BERN	1 S	1013.2	1016.6	10	7	19		0
	10400	BERN	1 S	1013.2	1016.6	10	6	17		
	9500	BERL	4 S/F	1014	1016.6	8	14			
	9100	ARCE	1 S	1016.4	1016.7	1.2				
	2800	OTTA	20 GRF	1100	1115	105	4.6	2.3		
	9100	ARCE	1 S	1148.8	1149	.6				
	1420	ARCE	1 S	1151.3	1151.6	.6				
	1470	BERL	3 S	1151.4	1151.7	.7	6.9			
	930	BORD	41 F	1254.7	1254.8	.4	16	2		
	2800	OTTA	23 GRF	1340	1450	180	6	3		
	536	ONDR	3 S	1348.7	1348.7	.3	14			
	7000	SAOP	22 GRF	1422						
	7000	SAOP	20 GRF	1422						
	7000	SAOP	1 S	1422	1627		10.5	38		
	2800	OTTA	8 S	1456.5	1456.5	.2	5			
	1420	ARCE	4 S/F	1510.5	1510.9	.8				
	930	BORD	41 F	1510.7	1511	.7	274	3		
	4995	BOUL	45 C	1625	1626	3	15	5		
	2800	OTTA	1A S	1626	1626.9	1.5	3	1.5		
	9400	HUAN	S	1626.1	1626.9	1.4	10.1	6.2		R
	2800	OTTA	8 S	1626.9	1626.9	.1	9.4			
	2695	PENT	1 S	2001.8	2003	2.5	3.4	1.5		
	1420	BOUL	45 C	2002	2006	11	132	44		
	4995	BOUL	45 C	2004	2005.5	3.5	18	6		
	2695	SGMR	3 S	2005	2006.1	3	18.9	7.6		
	4995	SGMR	3 S	2005	2006	3	24.8	9.9		
	1415	SGMR	3 S	2005	2006	4	208	83.1		
	2695	PENT	4 S/F	2005.2	2006	3.5	17.6	7.8		
	1420	BOUL	40 F	2021.5	2023.5	5	14	5		
	2800	OTTA	2 S/F	2022	2022.8	6	5.4	2.6		
	1420	BOUL	2 SF	2152.5	2153.5	1.5	7	2		
14	1420	BOUL	2 SF	0008.5	0009	1.5	6	2		
	4995	BOUL	8 S	0018	0018.5	1.5	20	7		
	10400	BERN	3 S	0525.6	0527.4	5.5	8	24		
	8400	BERN	3 S	0525.6	0527.4	5.5	17	46		0
	4995	ATHN	3 S	0526.5	0527.2	6.7	27.2	8.2		
	8800	ATHN	3 S	0526.8	0527.3	4.4	21	6.3		
	2695	ATHN	3 S	0527.3	0527.7	.6	3.5	1.1		
	260	ONDR	44 NS	0547 E		564 D	142			
	418	SGMR	44 NS	0922 E	1928.3	893 D	53.6			
	245	SGMR	44 NS	0922 E	2001.9	893 D	29.5			
	9100	ARCE	1 S	0738.4	0738.5	1.7				
	1470	BERL	1 S	0819.6	0820.8	1.9	1.8			
	930	BORD	41 F	0820	0820.8	1	33	6		
	1470	BERL	2 S/F	0932.8	0933.2	1.5	1.9			
	237	TRST	41 F	0953.9	0955.4	1.8	185			0
	4995	ATHN	3 S	1059.9	1102.8	15.1	20.1	6		
	8800	ATHN	3 S	1059.9	1102.8	14.3	28.6	6.2		
	9100	ARCE	22 GRF	1100.6	1103.1	22				
	1470	BERL	42 SER	1113.5	1120.4	7.3	13			
	1420	ARCE	8 S	1119.9	1120.1	.5				
	9100	ARCE	1 S	1158.7	1201.7	3.8				
	3000	BERL	2 S/F	1200.1	1202.4	3.6	4.2			

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JUL 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	1420	ARCE	4 S/F	1200.3	1200.5	1.6				
	1470	BERL	4 S/F	1200.4	1200.6	1.6	7.7			
	113	POTS	45 C	1205.1	1205.8	1.3	600	20		
	234	POTS	45 C	1331.2	1331.7	1.2	1800	400		
	237	TRST	41 F	1331.4	1331.7	.5	2450			O
	2800	OTTA	1 S	1331.5	1331.8	1	2.8	1.2		
	237	TRST	41 F	1513.7	1513.9	.2	175			O
	2800	OTTA	1 S	1535	1535.5	3	2.2	.8		
	237	TRST	41 F	1535.3	1535.3	.6	375			6L
	7000	SAOP	41 F	1556.5						3
	7000	SAOP	4 S/F	1556.5	1559.2	.3	55.5			
	4995	BOUL	8 S	1558	1558.5	1.5	37	12		
	8400	BERN	3 S	1558	1559.1	6	15	41		O
	10400	BERN	3 S	1558	1559.1	6	16	47		
	9100	ARCE	3 S	1558.3	1559.3	2.8				
	9400	HUAN	S	1558.5	1559	3.2	43.1	11.8		O
	8800	ATHN	3 S	1559	1559.2	1.2	41.3	12.4		
	237	TRST	41 F	1559	1559	.4	665			4L
	4995	ATHN	3 S	1559	1559.2	1.3	43.6	13.1		
	2800	OTTA	2 S/F	1559	1559.1	1	9.8	2.5		
	2800	OTTA	20 GRF	1613	1631	40	7.4	2.5		
	7000	SAOP	4 S/F	1623.5	1630.3	2.8	37.6			
	18	MCMA	6 S	1624	1626	7			1	
	9400	HUAN	S	1624.2	1632.4	27.6	18.2	6.8		R
	9100	ARCE	20 GRF	1625.7	1630.6	20				
	8400	BERN	20 GRF	1628	1630.3	70 U	16	31		O
	10400	BERN	20 GRF	1628	1630.3	70 U	17	50		
	4995	ATHN	3 S	1629.7	1630.3	5.6	16.8	5		
	9400	HUAN	S	1629.7	1630.3	1.6	13.2	9.1		R
	8800	ATHN	3 S	1629.8	1630.3	4.1	15.5	4.6		
	9400	HUAN	S	1726.5	1727.5	1.7	11.6	5.8		O
	1420	BOUL	4 SF	1730.5	1732.5	5	13	4		
	18	MCMA	6 S	1731	1736	7			2	
	245	SGMR	48 GB	1731.3	1734.5		1150			2,5
	245	SGMR	48 GB	1731.3	1733	4.4	1210	484		2,5
	410	SGMR	6 S	1731.4	1734.2	4.6	31.5	12.6		2,5
	606	SGMR	3 S	1731.4	1734.2	5.7	120	48		2,5
	1415	SGMR	3 S	1731.5	1733.1	8.3	37.2	15		2,5
	4995	BOUL	45 C	1731.5	1732	2	15	5		
	4995	SGMR	3 S	1731.5	1734.1	8.6	16	6.4		2,5
	2695	SGMR	3 S	1731.5	1732.8	8.2	13.5	5.4		2,5
	228	HARS	45 C	1731.7	1733	3.5	1900 U	200		
	7000	SAOP	46 C	1732	1732.8	.2	19	16		2 COMPONENTS
	930	BORD	46 C	1732	1733.2	4	161	7		
	237	TRST	42 SER	1732.1	1732.9	2.3	3450			O
	237	TRST		1732.1	1734.2		3700			4L
	2800	OTTA	3 S	1732.5	1732.9	3	11.6	5.8		
	9400	HUAN	S	1812.7	1827.6	26.8	14.9	3.6		R
	2800	OTTA	20 GRF	2133	2140	30	3.4	1.7		
	2800	OTTA	21 GRF	2216	2230	45	3.4	2		
	2800	OTTA	1 S	2223	2223.5	1.5	1.6	.8		
15	4995	MANI	3 S	0052.3	0054.5	7.7	149.5	49.8		
	2695	PENT	3 S	0053.5	0054.7	2.5	31.8	8		
	1415	MANI	47 GB	0053.9	0054.5	2.5	635	204.8		
	2695	MANI	1 S	0054	0054.5	.6	9.2	3.1		
	200	HIRA	46 C	0054	0054.5	3	1500	300		O
	100	HIRA	46 C	0054	0055	1.5	450	250		O
	500	HIRA	46 C	0054	0054.5	4	950	100		WR
	35000	NAGO	20 GRF	0054	0057	84	23			
	606	MANI	3 S	0054.2	0054.5	1.8	475	158		
	2695	PENT	29 PBI	0056	0056	20	4.8	2.4		
	2695	PENT	21 GRF	0124	0140	30 D	5.8			
	2695	PENT	4 S/F	0130	0134	9	26.4	11		
	4995	BOUL	4 SF	0130 U	0133.5	4 U	51	17		
	1420	BOUL	4 SF	0132	0133.5	2	23	8		
	2695	BOUL	4 SF	0132.5E	0135.5U	4 D	22	7		
	4995	MANI	3 S	0404	0404.7	1.7	42.2	14.1		I
	5730	IRKU	1 S	0404	0404.7	13	50	10		L
	4995	ATHN	4 S/F	0404.1	0404.6	1.1	61.8	18.5		
	2695	ATHN	3 S	0404.2	0404.7	1	32.9	9.9		
	1415	MANI	3 S	0404.2	0404.7	2.3	76.5	25.5		
	2695	MANI	3 S	0404.2	0404.7	1.3	26.3	8.8		
	606	MANI	4 S/F	0404.2	0404.4	1.2	73.2	24.4		
	1415	ATHN	4 S/F	0404.3	0404.7	.9	74.1	22.2		
	8800	ATHN	4 S/F	0404.3	0404.6	.9	73.4	22		
	1415	MANI	1 S	0426.7	0427	1.3	7.5	2.5		
	260	ONDR	44 NS	0651 E		519 D	71			
	245	SGMR	44 NS	0923 E	1949.3	892 D	142			
	410	SGMR	44 NS	0923 E	1949.5	892 D	34			
	127	TORN	43 NS	1053 U	1103.2	180 U	95	1 U		V=1
	10400	BERN	3 S	0744.5	0746.8	10	26	76		
	8400	BERN	3 S	0744.5	0746.8	10	25	67		+20
	8900	BERN	3 S	0744.5	0746.8	10	27	73		+20
	9500	BERL	3 S	0745	0746.7	9	64			

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JUL 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	9100	ARCE	3 S	0745.6	0746.9	7				
	8800	ATHN	4 S/F	0745.9	0746.7	3.8	78.6	23.6		
	4995	ATHN	3 S	0746	0746.6	3.2	16.3	4.9		
	6100	KISV	8 S	0746	0747	4	35			
	15000	KISV	8 S	0746	0747	4	215			
	8800	ATHN	3 S	0759.5	0802.1	9.8	31.4	9.4		
	8900	BERN	3 S	0800.2	0802.2	7	8	21		0
	10400	BERN	3 S	0800.2	0802.2	7	9	25		
	8400	BERN	3 S	0800.2	0802.2	7	7	19		0
	4995	ATHN	3 S	0800.3	0802.1	3.9	9.8	2.9		
	15000	KISV	3 S	0801	0802	2	47			
	6100	KISV	3 S	0801	0802	2	13			
	9500	BERL	3 S	0801.6	0802.2	11	21			
	9100	ARCE	1 S	0801.8	0802.5	4.5				
	10715	DWIN	3 S	0806	0808	5	100	30		
	536	ONDR	2 S/F	0902.6	0903.3	1.5	18	3.7		
	536	ONDR	27 RF	1050	1223.6	110	72	18		
	1470	BERL	20 GRF	1059	1113	29	16			
	808	ONDR	27 RF	1100	1221	97	70	31		
	930	BORD	40 F	1100	1113	48	22	5		
	2800	OTTA	20 GRF	1100	1113	90	13.6	4.6		
	1420	ARCE	20 GRF	1100	1112.8	36				
	3000	BERL	20 GRF	1104	1113	26	9			
	930	BORD	42 SER	1155	1211	28	123	11		
	234	POTS	45 C	1303.1	1306	5.6	650	80		
	7000	SAOP	3 S	1304	1306	.5	27.3	55		
	1420	BOUL	1 S	1304.5U	1305.5U	2.5U	3 U	1		
	808	ONDR	4 S/F	1304.8	1305.6	2	72	14		
	8400	BERN	4 S/F	1305	1306	5	8	22		+29
	8900	BERN	4 S/F	1305	1306	5	9	24		+18
	10400	BERN	4 S/F	1305	1306	5	6	19		
	3000	BERL	4 S/F	1305	1306	5	8.2			
	4995	BOUL	8 S	1305	1305.5	1	20	7		
	536	ONDR	4 S/F	1305	1305.4	1	94	3		
	6100	KISV	8 S	1305	1306	5	26			
	1470	BERL	4 S/F	1305.1	1306	2.9	6.2			
	9500	BERL	4 S/F	1305.2	1306	3.8	15			
	2800	OTTA	1 S	1305.2	1306	1.8	6.6	3.3		
	1420	ARCE	2 S/F	1305.2	1305.8	1.6				
	930	BORD	41 F	1305.3	1305.9	1.7	28	4		
	8800	ATHN	3 S	1305.4	1305.8	2	21.6	6.5		
	4995	SGMR	3 S	1305.4	1305.9	2.2	24.4	7.3		
	1415	SGMR	1 S	1305.5	1306	1.5	9	2.7		
	237	TRST	41 F	1305.5	1305.9	.8	750			0
	2695	SGMR	1 S	1305.5	1305.9	1.5	8.7	2.6		
	8800	SGMR	3 S	1305.5	1305.8	1.6	19.7	5.9		
	4995	ATHN	3 S	1305.5	1305.9	1.9	22.1	6.6		
	410	SGMR	6 S	1305.6	1306	.9	88.4	26.5		
	245	SGMR	7 S	1305.6	1306	.9	493	148		
	2695	ATHN	3 S	1305.6	1305.8	1	7.3	2.2		
	606	SGMR	3 S	1305.7	1306.1	.8	493	148		
	1415	ATHN	3 S	1305.7	1305.8	.8	6.1	1.8		
	15400	SGMR	1 S	1305.7	1305.9	.9	7.9	2.4		
	9100	ARCE	1 S	1305.8	1306.1	.6				
	9100	ARCE	29 PBI	1306.4		4.7				
	6100	KISV	3 S	1343	1344	4	7			
	234	POTS	2 S/F	1343.4	1343.6	2.3	250	20		
	237	TRST	41 F	1343.9	1344.3	.5	435			2L
	7000	SAOP	4 SC	1415	1950		112.2	35		3 COMPONENTS
	4995	BOUL	47 GB	1422.5	1425.5	6.5	1072	357		
	930	BORD	46 C	1423	1425	21	208	15		
	3000	BERL	47 GB	1423	1425.3	42	298			
	1420	BOUL	3 S	1423	1425.5	4.5	150	50		
	9500	BERL	47 GB	1423.3	1425.1	42	1130			
	4995	ATHN	47 GB	1423.3	1425.2	33.1	1956	586.8		
	8800	SGMR	47 GB	1423.5	1425.2	11.5	1830	549		5,SWF
	9400	HUAN	- S	1423.5	1425	5.3	281.7	91.5		R
	1470	BERL	47 GB	1423.5	1425.6	42	159			
	8800	ATHN	47 GB	1423.7	1425.2	49.5	2698	809.4		
	536	ONDR	45 C	1423.7	1424.3	6.5	136	67		
	15400	SGMR	47 GB	1423.7	1425.2	10.6	1170	351		5,SWF
	10400	BERN	47 GB	1423.8	1425.2	25	420 D	1218 D		
	8400	BERN	47 GB	1423.8	1425.2	25	505	1346		+13
	2800	OTTA	3 S	1423.8	1425	16.2	450	48		
	2695	ATHN	47 GB	1423.8	1425.3	25.7	615	184.5		
	4995	SGMR	47 GB	1423.8	1425.3	12.3	1360	408		5,SWF
	1415	SGMR	3 S	1423.8	1425.5	14.9	202	60.6		5,SWF
	8900	BERN	47 GB	1423.8	1425.2	25	500	1353		+14
	2695	SGMR	47 GB	1423.9	1425.4	13.5	600	180		5,SWF
	9100	ARCE	3 S	1423.9	1425.4	7.3				
	1415	ATHN	4 S/F	1423.9	1425.4	27.4	177.5	53.2		
	1420	ARCE	3 S	1423.9	1425.4	6.2				
	606	SGMR	47 GB	1424	1424.8	14.7	1190	357		5,SWF
	808	ONDR	45 C	1424	1426.2	6	111	31		
	260	ONDR	3 S	1424		6	216 D	75		

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	245	SGMR	49 GB	1424.2	1425.1	13.2	7670	2300		5,SWF
	234	POTS	45 C	1424.3	1424.7	7.8	12000	2500		
	410	SGMR	49 GB	1424.3	1425.3	14.5	596	179		5,SWF
	228	HARS	45 C	1424.4	1425 U	1.2	2300 D	800		
	113	POTS	45 C	1424.5	1425.4	7.1	35000	9000		
	2695	BOUL	47 GB	1424.5	1426	15 D	537	179		
	237	TRST	47 GB	1424.5	1424.9	1	9500			8R
	127	TORN	47 GB	1424.6	1424.70	4.5U	1300 D	300 D		INCOMPLETE
	35000	SGMR	3 S	1424.6	1425.1	2.1	349	105		5,SWF
	1420	BOUL	30 PBI	1427.5	1427.5	3.5	23	8		
	4995	BOUL	30 PBI	1429.5	1429.5	5.5	64	21		
	1420	ARCE	29 PBI	1430.1		33				
	9400	HUAN	PBI	1430.8	1430.8	36.3	14.9	10.3		D
	9100	ARCE	29 PBI	1431.2		37				
	2800	OTTA	29 PBI	1440	1440	50	6.8	3.4		
	10715	DWIN	45 C	1443		15	800 D			
	2650	DWIN	45 C	1443		25	180 D			
	536	ONDR	2 S/F	1445	1446	1	21			
	9100	ARCE	20 GRF	1516.3	1518.8	67.5				
	9400	HUAN	S	1517.6	1518.7	5	13.2	4.3		D
	9400	HUAN	S	1738.8	1751.6	30.2	11.6	5.1		D
	4995	BOUL	45 C	1946 E	1949.5	10.5D	50	17		
	1420	BOUL	45 C	1947.5	1950 U	7	11	4		
	2800	OTTA	4 S/F	1948.5	1950	3.5	32	15		
	9400	HUAN	C	1948.8	1950.1	6.2	66.3	18.6		R
	2695	BOUL	4 SF	1949.5	1951	8.5D	28	9		
	2800	OTTA	30 PBI	1952	1952	15	4.4	2		
	2800	OTTA	1 S	1954	1954.4	1.5	7.6	3.8		
	2695	PENT	20 GRF	2310	2440	160	2.8	1.4		
16	4995	BOUL	4 SF	0052	0053.5	5.5U	117	39		
	1420	BOUL	8 S	0053.5	0054	1				
	2695	BOUL	3 S	0055	0055.5	4 U	22	7		
	200	HIRA	7 C	0431	0431.2	1	300	80		D
	100	HIRA	46 C	0431	0431.3	1.5	830	350		
	6100	KISV	4 S/F	0647	0648	6	9			
	6100	KISV	2 S/F	0822	0824	4	3			
	410	SGMR	44 NS	0924 E	1332.4	890 D	29.6			3
	245	SGMR	44 NS	0924 E	1559.1	890 D	29.9			3
	7000	SAOP	3 S	1223.4	1225.8	.8	21.6	26		
	7000	SAOP	41 F	1223.4						2
	9400	HUAN	S	1225.1	1225.7	2	14	7		R
	9100	ARCE	1 S	1225.3	1225.8	2				
	6100	KISV	29 PBI	1233	1235	12	14			
	4995	ATHN	3 S	1245.7	1248.8	5.6	13.4	8		
	15000	KISV	8 S	1247	1249	5	97 D			
	8800	ATHN	4 S/F	1247.3	1248.8	5.4	87.8	26.4		
	8900	BERN	3 S	1248	1248.9	21	24	65		+10
	10400	BERN	3 S	1248	1248.9	21	33	97		
	8400	BERN	3 S	1248	1248.9	21	21	57		+5
	9500	BERL	4 S/F	1248	1248.8	13	63			
	9400	HUAN	S	1248.2	1248.6	4.6	84.3	21.1		R
	7000	SAOP	3 S	1248.2	1248.8	.7	34.6	12		
	9100	ARCE	3 S	1248.5	1248.9	5				
	6100	KISV	8 S	1249	1250	4	16			
	8800	SGMR	3 S	1249.4	1249.8	3.1	65.7	13.1		
	15400	SGMR	3 S	1249.4	1249.8	2.2	220	44		
	35000	SGMR	3 S	1249.4	1249.8	2.1	100.5	20.1		
	10715	DWIN	3 S	1308	1309	2	110	40		
	7000	SAOP	3 S	1546.5	1611.6	1.2	20.7	26		
	2800	OTTA	1 S	1555.8	1556	1.2	3.6			
	2800	OTTA	29 PBI	1557	1557	10	1.8	.9		
	9400	HUAN	S	1610.7	1611.5	1.7	7	3.8		R
	2800	OTTA	1A S	1610.8	1611.5	1.5	3.6	1.8		
	2800	OTTA	8 S	1611.5E	1611.5	.1	3.6			
	2800	OTTA	29 PBI	1612.3	1612.3	18	1.8	.9		
	2800	OTTA	1 S	1822	1823	2	1.8	.9		
	9400	HUAN	S	1946.8	1947.7	6	26.3	11.8		D
	1420	BOUL	45 C	2348.5	2350.5	2.5	4	1		
	700	SYDN	45 C	2351	2351.1	.6				
	1400	SYDN	2 S	2351.1	2351.3	.6				
17	700	SYDN	42 SER	0012	0017.5	10.8				
	606	MANI	4 S/F	0012.4	0017.8	12.5	344	114.7		
	2695	PENT	20 GRF	0020	0030	50	3	1.5		
	6100	KISV	3 S	0856.7	0857.5	2	4			
	410	SGMR	44 NS	0925 E	1428.1	888 D	221			3
	245	SGMR	44 NS	0925 E	1737.4	888 D	61.4			3
	9500	BERL	21 GRF	1022	1032	23	7.8			
	10400	BERN	3 S	1030.4	1031.4	10	4	11		
	8400	BERN	3 S	1030.4	1031.4	10	5	13		0
	8900	BERN	3 S	1030.4	1031.4	10	5	13		0
	3000	BERL	1 S	1031	1031.4	1	2.6			
	9500	BERL	3 S	1031.1	1031.5	1.8	9.1			
	7000	SAOP	3 S	1122.5	1124.6	2.6	10.3	19		

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	6100	KISV	30 PBI	1130	1131.5	6	27			
	260	ONDR	42 SER	1232	1316.2	53	26			
	9500	BERL	40 F	1337	1341.4	73	32			
	7000	SAOP	3 S	1339.3	1341.3	.6	33	16		
	7000	SAOP	41 F	1339.3						3
	10400	BERN	3 S	1339.4	1340.5	6	11	33		
	2800	OTTA	21 GRF	1340		80	3.2			
	6100	KISV	4 S/F	1340	1341.3	5	37			
	8800	ATHN	3 S	1340.2	1340.7	2.8	37.7	22.6		
	4995	ATHN	3 S	1340.2	1340.7	2.2	14.3	8.6		
	9400	HUAN	S	1340.7	1341.5	5.1	39.1	12.9		0
	2800	OTTA	40 F	1341	1352	21	3.6			
	9100	ARCE	3 S	1341	1341.5	2.5				
	7000	SAOP	20 GRF	1351.6	1405.5		18.5	18		
	3000	BERL	2 S/F	1351.7	1356.5	6.3	7.4			
	9400	HUAN	S	1351.8	1405.8	26.4	26	10.4		0
	10400	BERN	22 GRF	1352	1404.8	90	9	27		
	8400	BERN	22 GRF	1352	1404.8	90	9	24		0
	8900	BERN	22 GRF	1352	1404.8	90	10	26		0
	9100	ARCE	20 GRF	1354.5	1405.7	57				
	1470	BERL	1 S	1354.6	1355.2	2.4	1.3			
	3000	BERL	4 S/F	1423.5	1428.5	10	9.9			
	4995	ATHN	40 F	1423.6	1426.3	7.2	25.1	12.5		
	8800	ATHN	40 F	1423.6	1426	7.4	21.6	10.8		
	2800	OTTA	21 GRF	1424	1427	12	6	2.6		
	7000	SAOP	3 S	1424.5	1426.7	1.8	18.5	18		
	4995	BOUL	4 SF	1424.5U	1425.5	2 U	20	7		
	9400	HUAN	S	1425	1427.1	6.2	14.6	7.2		0
	1420	BOUL	45 C	1425.5U	1426.5	3	2	1		
	1470	BERL	2 S/F	1426	1427.4	2.8	2.6			
	2800	OTTA	8 S	1428.6	1428.6	.1E	12			
	2800	OTTA	21 GRF	1620	1626	30	4.4	1.6		
	2800	OTTA	1 S	1624	1624.5	1	2.6	1.3		
	2800	OTTA	20 GRF	1730	1800	80	3.2	1.6		
	2800	OTTA	20 GRF	2113	2120	16	3	1.4		
	15400	SGMR	47 GB	2131.5	2134	5.5	826	330		3G,SWF
	9400	HUAN	S	2131.7	2134.1	18.1	302.4	85.4		L
	4995	BOUL	45 C	2132.5	2133.5	5.5	32	11		
	8800	SGMR	3 S	2133	2134	5	323	129		3G,SWF
	4995	SGMR	3 S	2133.2	2134	2.8	28.6	11.4		3G,SWF
	35000	SGMR	47 GB	2133.5	2134.2	2.5	932	372		3G,SWF
	2800	OTTA	20 GRF	2135	2139	20	5	2.4		
	35000	NAGO	5 S	2135	2135	1 E	44			
	35000	NAGO	29 PBI	2136	2139	16	16			
18	700	SYDN	40 F	0006.2	0008.5	3.9				
	4995	HANI	3 S	0016.4	0018.5	8.7	119.6	39.8		
	2695	PENT	47 GB	0017	0018.6	3	1000	65		
	2695	HANI	47 GB	0017.7	0018.2	1.9	895	296.6		IKES
	1400	SYDN	40 F	0017.8	0019.5	2.2				
	35000	NAGO	20 GRF	0018	0019	9	17			
	1415	HANI	4 S/F	0018.9	0019.4	1.1	61.1	20.4		
	2695	PENT	29 PBI	0020	0020	40	6	3		
	35000	NAGO	20 GRF	0026	0032	12	11			
	9100	ARCE	21 GRF	0748.4	0916.5	213				
	3000	BERL	22 GRF	0758.3	0803	7.5	4.2			
	1420	ARCE	40 F	0759.3	0802.7	7				
	1470	BERL	45 C	0759.5	0802.4	8.5	4.3			
	536	ONDR	41 F	0800	0802.5	4	11			
	508	ONDR	2 S/F	0800	0801	4	58	6		
	10400	BERN	20 GRF	0848.2	0857.7	50	18	53		
	8400	BERN	20 GRF	0848.2	0857.7	50	20	53		0
	8900	BERN	20 GRF	0848.2	0857.7	50	20	54		0
	8400	BERN	1 S	0848.2	0849.4	50	5	12		0
	8900	BERN	1 S	0848.2	0849.4	50	5	12		0
	10400	BERN	1 S	0848.2	0849.4	50	4	12		
	8800	ATHN	28 GRF	0854.4	0857.7	15.8	64.4	38.6		
	9100	ARCE	22 GRF	0854.6	0858	18				
	9500	BERL	4 S/F	0855	0857	58	45			
	4995	ATHN	20 GRF	0855.2	0857.8	11.4	23.5	14.1		
	260	ONDR	43 NS	0856		378 D	23			
	410	SGMR	44 NS	0925 E	2132.3	860 D	135			
	245	SGMR	44 NS	0925 E	2113.7	860 D	73.2			
	200	HIRA	44 NS	1940 E	2020	855 D	45	5		WLMR
	100	HIRA	44 NS	1940 E	2130	150 D	60	30		
	228	HARS	43 NS	1957.3	2010.2U		220			SUNSET
	1470	BERL	1 S	1218.9	1219.8	1.9	2			
	3000	BERL	3 S	1218.9	1219.7	1.6	13			
	2800	OTTA	3 S	1219	1219.5	1	20.6	9		
	9400	HUAN	S	1259	1306.3	27.1	26.2	9.8		0
	2800	OTTA	28 GRF	1305	1315	35	1.8	1		
	9500	BERL	40 F	1305.2	1306.4	30	27			
	8400	BERN	20 GRF	1305.2	1306.3	22	10	27		0
	8900	BERN	20 GRF	1305.2	1306.3	22	10	27		0
	10400	BERN	20 GRF	1305.2	1306.3	22	8	27		

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	8800	ATHN	20 GRF	1305.3	1308	12.8	46.4	27.9		
	7000	SAOP	20 GRF	1305.5	1308.4	6.4	26.5			
	4995	ATHN	20 GRF	1305.5	1308.1	13	17.3	10.4		
	9100	ARCE	20 GRF	1305.9	1308.4	27				
	6100	KISV	20 GRF	1310	1313	35	14			
	2800	OTTA	23 GRF	1410	2135	585	10.6	6		
	1420	BOUL	2 SF	1459	1500	2	5	2		
	2800	OTTA	20 GRF	1500	1538	65	6	2.4		
	930	BORD	41 F	1501.6	1502.6	2.7	10	2		
	7000	SAOP	20 GRF	1522	1537.4	10.7	22.4	13		
	8400	BERN	20 GRF	1526.2	1537.4	32	6	14		0
	8400	BERN	20 GRF	1526.2	1537.4	32	5	13		0
	10400	BERN	20 GRF	1526.2	1537.4	32	6	17		
	9100	ARCE	20 GRF	1528.4	1537.6	32				
	9400	HUAN	S	1530.7	1537.7	34.3	13.1	6.5		0
	7000	SAOP	24 R	1631						
	9400	HUAN	S	1631.4	1642.6	20.9	14.7	6.7		0
	7000	SAOP	4 S/F	1719	1724.8	2.7	57	16		
	9400	HUAN	C	1719	1724.1	9.8	109.6	54.2		L
	4995	SGMR	45 C	1719.1	1723.7	22.3	16.8	6.7		SWF
	4995	SGMR	45 C	1719.1	1724.6		21.5			SWF
	8800	SGMR	45 C	1719.2	1724.4		88.4			SWF
	8800	SGMR	45 C	1719.2	1723.7	20.4	83.8	33.5		SWF
	15400	SGMR	45 C	1719.4	1723.8	20.6	151	60.2		SWF
	15400	SGMR	45 C	1719.4	1724.4		159			SWF
	35000	SGMR	3 S	1720.5	1724	5.5	110	44		SWF
	10400	BERN	46 C	1721.9	1723.8	30	35	101		
	8400	BERN	46 C	1721.9	1723.8	30	22	58		0
	8900	BERN	46 C	1721.9	1723.8	30	24	64		0
	9100	ARCE	4 S/F	1723.5	1724	3.2				
	9100	ARCE	29 PBI	1726.7		24.5				
	7000	SAOP	45 C	1806	1958.2		173.4	14		
	2800	OTTA	20 GRF	1815	1820	30	3	1.5		
	2800	OTTA	23 GRF	1935	2005	90	19	6.6		
	9400	HUAN	F	1938.3	1958.4	49	176.7	95.5		0
	9400	HUAN		1938.3	2021.8		265			R
	8800	SGMR	45 C	1941.4	1958	67.6	165	77.4		SWF
	8800	SGMR	45 C	1941.4	2021.7		258			SWF
	15400	SGMR	45 C	1943.3	1958.1	65.1	140	68.4		SWF
	15400	SGMR	45 C	1943.3	2022.7		228			SWF
	1420	BOUL	40 F	1944.5E	1955.5	43.5D	72	24		
	606	SGMR	47 GB	1945	1955.2	54.3	21.4	743		SWF
	606	SGMR	47 GB	1945	2021.7		2480			SWF
	1415	SGMR	45 C	1945	1956	45.9	95.9	38.4		SWF
	1415	SGMR	45 C	1945	2019.6		41.3			SWF
	2695	BOUL	40 F	1945.5	1959	44.5D	51	17		
	4995	SGMR	45 C	1946.5	2021.8		121			SWF
	4995	SGMR	45 C	1946.5	1958	62	132	52.9		SWF
	245	SGMR	7 C	1947.5	2010.5	52.7	82.9	43.3		SWF
	2695	SGMR	45 C	1947.5	2019.6		37.7			SWF
	245	SGMR	7 C	1947.5	2018.7		144			SWF
	2695	SGMR	45 C	1947.5	1958.1	58.5	52.7	21.1		SWF
	4995	BOUL	45 C	1949.5	1958.5	39 D	117	39		
	410	SGMR	7 C	1950.2	2000	48.8	122	86.5		SWF
	410	SGMR	7 C	1950.2	2023.4		288			SWF
	2800	OTTA	4 S/F	1951	1958	13	47.6	23.4		
	2800	OTTA	4 S/F	2017	2022	9	33.8	17.2		
	9400	HUAN	PBI	2027.3	2027.3	37.2	40.9	19.9		0
	2695	PENT	26 FAL	2355	2418	23	-3	-1.5		
19	4995	BOUL	45 C	0015.5	0017.5	18.5U	115	38		
	1420	BOUL	45 C	0017	0019	2 U	43	14		
	2695	BOUL	4 SF	0017.5	0019.5	3.5D				
	260	ONDR	44 NS	0604 E		562 D	54	4		
	202	IZMI	43 NS	0730		250	65			
	245	SGMR	44 NS	0927 E	1034.4	885 D	127.4			
	410	SGMR	44 NS	0927 E	1801.3	885 D	64.3			
	536	ONDR	42 SER	0829	0915.8	91	292			
	3000	BERL	2 S/F	1319.7	1321.4	4.3	6.1			
	2800	OTTA	1 S	1320	1321.2	6.5	5.8	2		
	9400	HUAN	S	1321	1339.6	32.2	7	3.2		0
	930	BORD	41 F	1453	1453.3	.6	43	3		
	2800	OTTA	8 S	1647	1647	.5	5			
	2800	OTTA	20 GRF	2050	2155	125	3	1.5		
20	35000	NAGO	21 GRF	0002	0006	35	9			
	35000	NAGO	5 S	0005	0005	1 E	18			
	4995	MANI	20 GRF	0007	0014	16.4	46.8	15.6		
	2695	PENT	21 GRF	0009	0020	100 D	8.4			
	2695	PENT	1 S	0011.5	0013	5	6.6	3.3		
	500	HIRA	46 C	0014	0016.8	4	9	5		WL
	200	HIRA	46 C	0231	0231.2	9	65	35		WR
	100	HIRA	46 C	0231	0234	6	500	150		0
	500	HIRA	46 C	0314.3	0315.6	4	10	4		SR
	100	HIRA	46 C	0317	0317	9	100	50		0

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	260	ONDR	44 NS	0535 E		583 D	13			
	245	SGMR	44 NS	0928 E	2126.8	883 D	71.4			3G
	410	SGMR	44 NS	0928 E	2127.2	883 D	64.4			3G
	10400	BERN	3 S	0551.1	0552.6	6.5	7	20		
	6100	KISV	4 S/F	0552	0553	3	21			
	4995	ATHN	3 S	0552.3	0552.5	6.6	16	9.6		
	8800	ATHN	3 S	0552.3	0552.5	7.9	26.2	15.7		
	1470	BERL	1 S	0739.2	0739.4	.4	5.6			
	9100	ARCE	24 S	0805.5		89.5				
	9100	ARCE	21 GRF	0945.8	1133.1	232				
	8400	BERN	2 S/F	1129	1129.6	11	4	10		0
	8900	BERN	2 S/F	1129	1129.6	11	4	12		0
	10400	BERN	2 S/F	1129	1129.6	11	4	13		
	9100	ARCE	1 S	1129.1	1129.7	1.4				
	3000	BERL	2 S/F	1306.8	1307.3	1.4	2.9			
	1470	BERL	1 S	1306.8	1307.3	1.4	1.9			
	2800	OTTA	1 S	1306.9	1307.1	1	2.8	1.4		
	2800	OTTA	24 R	1500	1520	20	2.8	1.4		
	2800	OTTA	27 RF	1500		170	2.8	2.4		
	9500	BERL	3 S	1509.5	1514.4	14	63			
	3000	BERL	1 S	1513.3	1514.4	3.7	2.9			
	2800	OTTA	24P R	1520		120	2.8			
	2800	OTTA	26 FAL	1720	1750	30	-2.8	-1.4		
	2695	PENT	240 R	1955	2023	28	2.6	1.3		
	9400	HUAN	S	2126.2	2127	2.3	11.6	5.2		0
	1420	BOUL	8 S	2142.5	2143	1.5	12	4		
	2695	PENT	1 S	2142.9	2143.5	2	3	1.8		
	2695	BOUL	2 SF	2143 E	2144	2 D	4	1		
21	4995	BOUL	45 C	0010	0014	5 D	39	13		
	410	SGMR	44 NS	0928 E	1426.3	882 D	87.8			
	245	SGMR	44 NS	0928 E	1524.2	882 D	58.7			
	6100	KISV	4 S/F	1115	1119.6	25	14			
	8400	BERN	22 GRF	1117	1119.3	12	7	19		-9
	3900	BERN	22 GRF	1117	1119.3	12	6	16		-7
	10400	BERN	22 GRF	1117	1119.3	12	8	22		
	8800	ATHN	3 S	1118.3	1119.7	7.4	28.2	8.5		
	4995	ATHN	3 S	1118.7	1119.5	7.7	6.9	2.1		
	1415	ATHN	20 GRF	1532.5	1540.1	21.8	12.2	7.3		
	4995	ATHN	20 GRF	1533.5	1540.3	27.7	48.4	29.1		
	2800	OTTA	21 GRF	1535	1543	155	11.4	2.8		
	7000	SAOP	4 S/F	1536.5	1540.2	1.2	61	7		
	9400	HUAN	S	1536.8	1540.3	5.8	52.6	21.5		L
	8900	BERN	3 S	1537.4	1540.2	38	16	43		-7
	10400	BERN	3 S	1537.4	1540.2	38	15	44		
	8400	BERN	3 S	1537.4	1540.2	38	17	46		-9
	8800	ATHN	20 GRF	1537.6	1540.3	12.2	50.8	30.5		
	4995	SGMR	3 S	1537.7	1540.2	7.8	38.9	11.7		SWF
	8800	SGMR	3 S	1538	1548	4	47.5	14.3		SWF
	15400	SGMR	3 S	1538	1540.2	3	39.9	12		SWF
	2650	OMIN	45 C	1538		12	180 D			
	10715	OMIN	3 S	1538	1540	12	40	20		
	1420	BOUL	45 C	1538	1539.5	7	7	2		
	4995	BOUL	45 C	1538	1539	7 D	25	8		
	2800	OTTA	4 S/F	1538	1540	4	438			
	2695	SGMR	3 S	1538.1	1539.9	7.3	102	30.6		SWF
	2695	ATHN	40 F	1538.3	1539.3	12.4	373	186.5		
	2695	BOUL	45 C	1538.5	1540.5	9.5U	332 U	111		
	930	BORD	41 F	1539	1540.6	2	65	4		
	1415	SGMR	3 S	1539.1	1544.6	6.3	21.1	6.3		SWF
	9100	ARCE	3 S	1539.3	1540.3	2.4				
	9100	ARCE	29 PBI	1541.7		53				
	9400	HUAN	PBI	1542.6	1542.6	22	16.4	7.5		L
	2800	OTTA	8 S	1643.6	1643.6	.1E	22			
	9400	HUAN	S	1826.1	1828	3.6	27.9	6.9		0
	2800	OTTA	2 S/F	1827	1827.1	1.2	2.2	1.1		
	2800	OTTA	21 GRF	1835	2000	385	13.6	8.2		
	9400	HUAN	PRE	1838.8	1854.6	15.8	19.7	5.3		0
	2800	OTTA	3 S	1843.9	1843.9	1.2	15.8	2.6		
	7000	SAOP	45 C	1850	1856.5	2.4	172	6		
	2800	OTTA	3 S	1852.5	1857	10	126	43		
	2695	SGMR	3 S	1853.2	1856	16.8	140	56.1		SWF
	4995	BOUL	4 SF	1853.5	1855.5	17 D	111	37		
	4395	SGMR	3 S	1854	1856	16	142	56.9		SWF
	1420	BOUL	45 C	1854	1856.5	28.5D	54	18		
	1415	SGMR	3 S	1854.2	1856.6	15.8	68.8	27.5		SWF
	15400	SGMR	3 S	1854.5	1856	15.5	102	40.9		SWF
	8800	SGMR	3 S	1854.5	1856.8	15.5	140	55		SWF
	2695	BOUL	3 S	1854.5	1857.5	16.5D	103	34		
	9400	HUAN	F	1854.6	1856.7	6.9	118.2	51.6		L
	9400	HUAN	PBI	1901.5	1901.5	75.2	8.2	7.1		0
	2800	OTTA	29 PBI	1902.5	1902.5	14	8.6	3.8		
22	260	ONDR	44 NS	0554 E		539 D	30			
	410	SGMR	44 NS	0929 E	1227.6	880 D	21.6			3G,S

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JULY 1978

JUL 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	245	SGMR	44	NS	0929 E	1443.1	880 D	23.5			3G.5
	113	POTS	2	S/F	1016.6	1017.9	2	700	7		
	237	TRST	5	S	1017.8	1017.8	.1	185	60		12R
	113	POTS	2	SF	1226.5	1228.5	2.6	100	1		
	2650	DWIN	45	C	1235	1247	10	40	10		
	3000	BERL	3	S	1250	1257.1	9	12			
	2800	OTTA	2	S/F	1250	1251	3	9.6	4.8		
	2695	SGMR	3	S	1250.6	1257	7.4	35.9	10.8		
	2800	OTTA	4	S/F	1255.8	1257	3.2	14.6	4.8		
	2800	OTTA	29	PBI	1259	1259	9	2.4	1.2		
	2695	ATHN	3	S	1301	1302	3.3	32.3	9.7		
	2800	OTTA	24	R	1310	1330	20	3	1.6		
	2800	OTTA	27A	RF	1310		150	3	2.5		
	1470	BERL	2	S/F	1317.6	1318.7	1.5	9.7			
	2800	OTTA	1	S	1318	1319	1.2	1.2	.8		
	2800	OTTA	24P	R	1330		100	3			
	8800	ATHN	20	GRF	1350.6	1353.6	13.1	11.3	6.8		
	2800	OTTA	26	FAL	1510	1540	30	-3	-1.5		
23	260	ONDR	44	NS	0607 E		323	13			
	245	SGMR	44	NS	0930 E	1027.8	878 D	7.8			3,5
	113	POTS	45	C	1425	1426	2.4	100	5		
	2800	OTTA	20	GRF	1447	1510	50	2.2	1.1		
	2800	OTTA	4	S/F	1654	1700	9	11.4	5.7		
	2800	OTTA	30	PBI	1703	1703	27	4.2	2.1		
	930	BORD	8	S	1704	1704	.2	14	1		
	245	SGMR	6	S	1716.4	1722.7	11.8	25.8	7.7		3
	930	BORD	3	S	1720	1724.3	18	14	6		
	1415	SGMR	3	S	1720.7	1724	7.1	12.3	3.7		3
	2800	OTTA	2	S/F	1721	1724	6	4.6	.8		
	2695	SGMR	1	S	1721.2	1724.2	5.2	6.4	1.9		3
	606	SGMR	1	S	1723.5	1724.4	3.2	7.4	2.2		3
	410	SGMR	6	S	1727.2	1725.6	4.8	15.6	4.7		3
	2800	OTTA	20	GRF	1745	1752	22	2.8	1.4		
	2800	OTTA	27	RF	1835		205	2.8	2.3		
	2800	OTTA	24	R	1835	1910	35	2.8	1.4		
	2800	OTTA	24P	R	1910		140	2.8			
	2800	OTTA	26	FAL	2130	2200	30	-2.8	-1.4		
24	1420	BOUL	4	SF	0052.5	0053.5	7.5D	12	4		
25	202	IZMI	41	F	1058	1100	3	140			
	2800	OTTA	240	R	2140	2200	20	2.2	1.1		
28	9100	ARCE	1	S	1128.3	1128.8	1.4				
	536	ONDR	8	S	1237	1237	.2	31			
	536	ONDR	41	F	1353.6	1353.6	1.5	10			
	260	ONDR	41	F	1405	1410	7	17			
	606	SGMR	3	S	1425.4	1425.8	.7	54.9	22		
	245	SGMR	6	S	1425.4	1426.8	2	26.6	10.6		
	1415	SGMR	3	S	1425.5	1425.8	.7	21.7	8.7		
	2695	SGMR	3	S	1425.5	1425.7	.5	20.4	8.2		
	930	BORD	8	S	1447.6	1447.6	.1	33	1		
	536	ONDR	3	S	1456.3	1456.3	.3	18			
29	2800	OTTA	20	GRF	1050	1115	260 D	7.4 -			
	2800	OTTA	20	GRF	1830	1850	50	2.2	1.2		
30	536	ONDR	8	S	1400	1400	.2	49			
	2800	OTTA	20	GRF	1827	1900	205	3	1.5		
	9400	HUAN		S	2158.3	2202.7	6.7	10.2	3.2		0
31	260	ONDR	4	S/F	0750.7	0750.7	2	18			
	9100	ARCE	20	GRF	1132	1307.5	230				

Reports received from the following observatories:

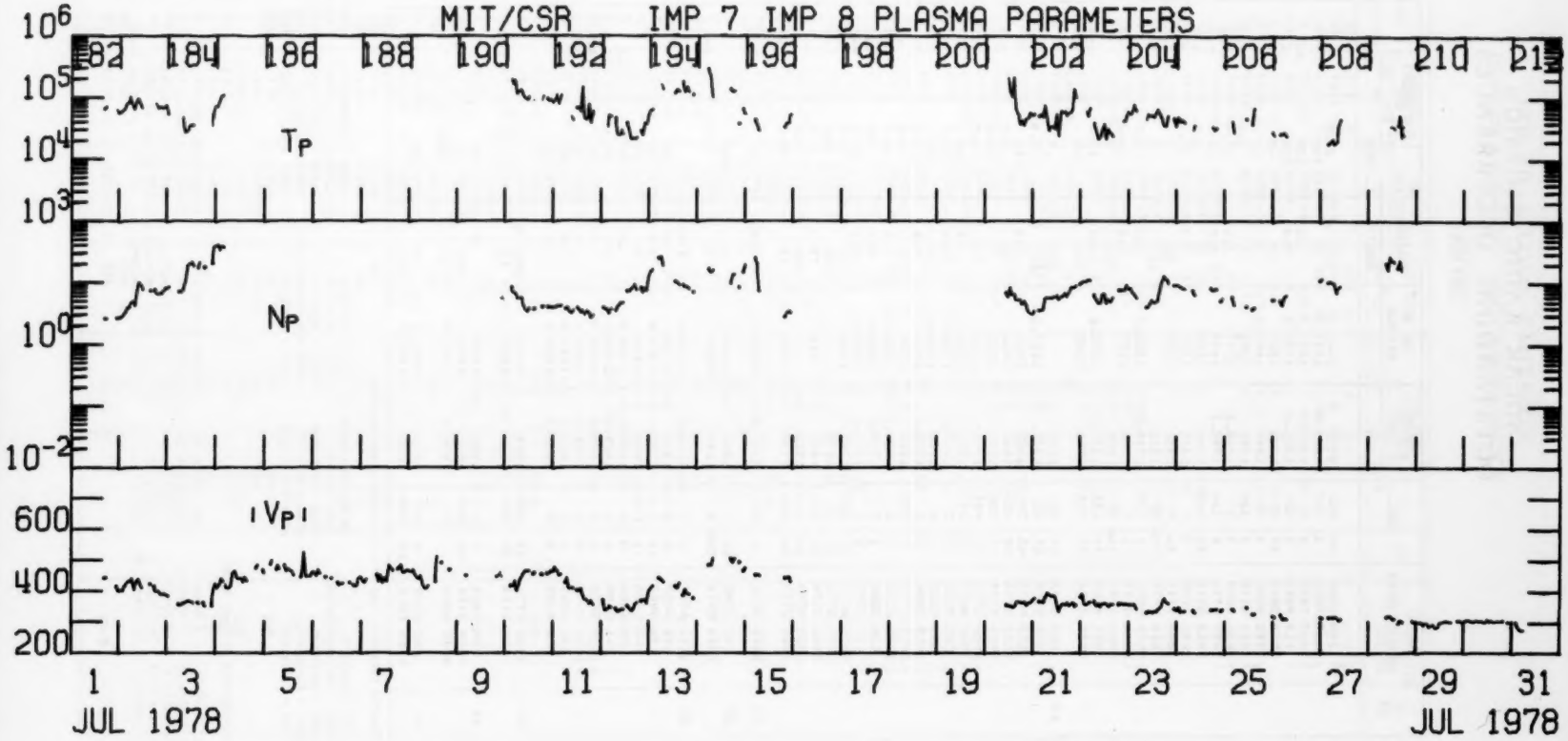
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
NAGO = Nagoya
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

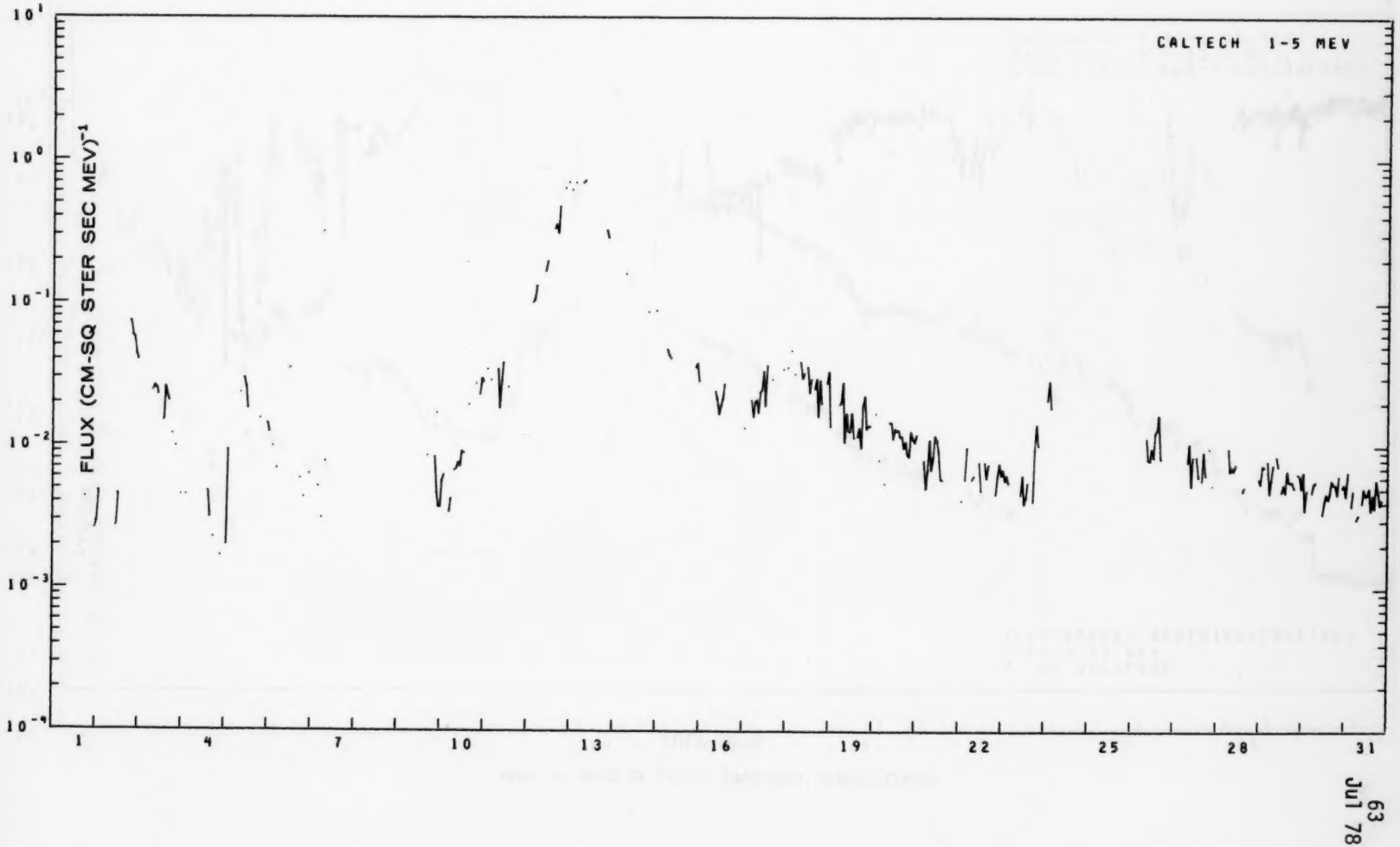
IMP 7 AND 8 SOLAR WIND PLASMA

JULY 1978



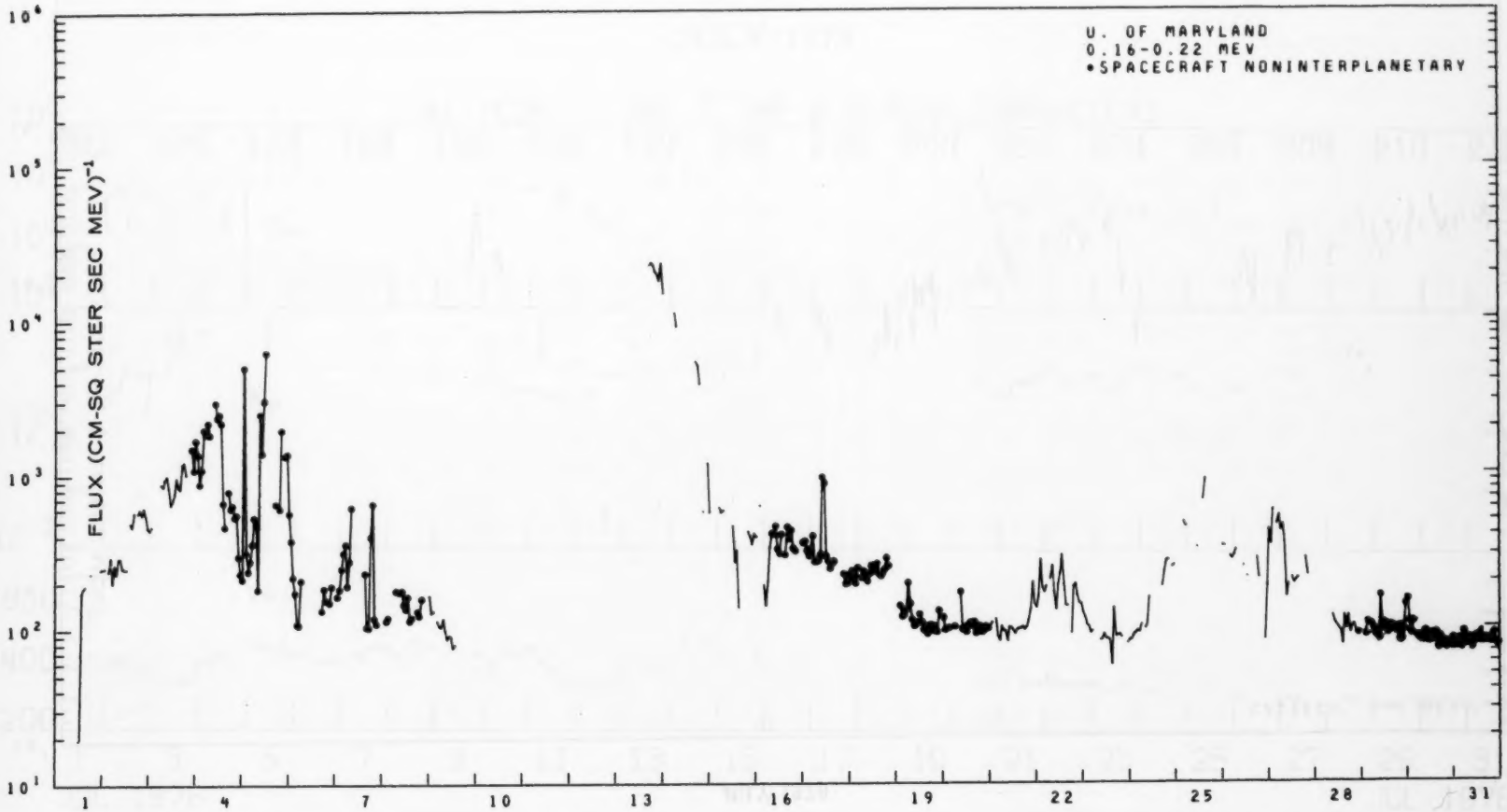
IMP 7 AND 8 ELECTRONS

JULY 1978



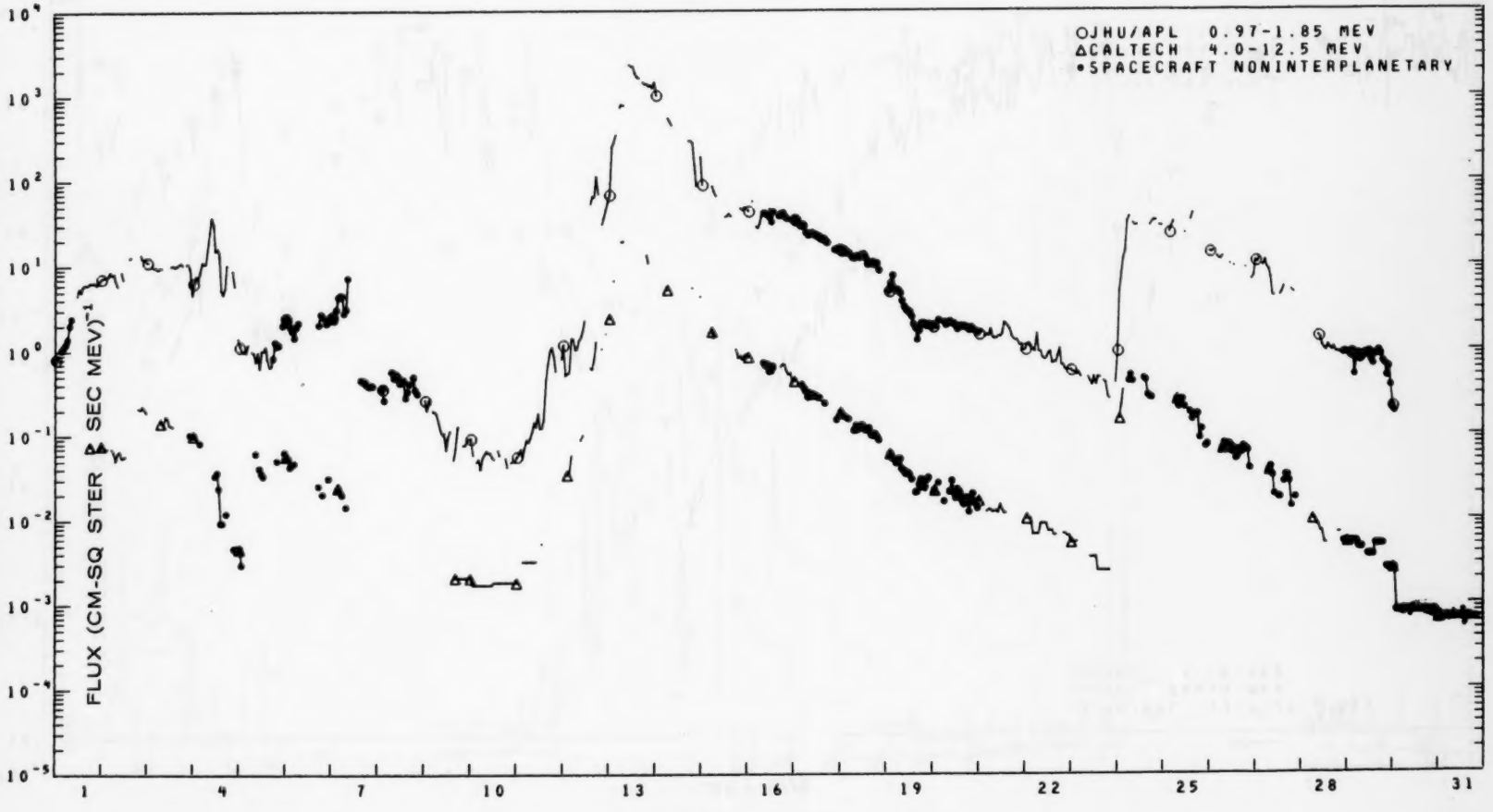
IMP 7 AND 8 LOW ENERGY PROTONS

JULY 1978



IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

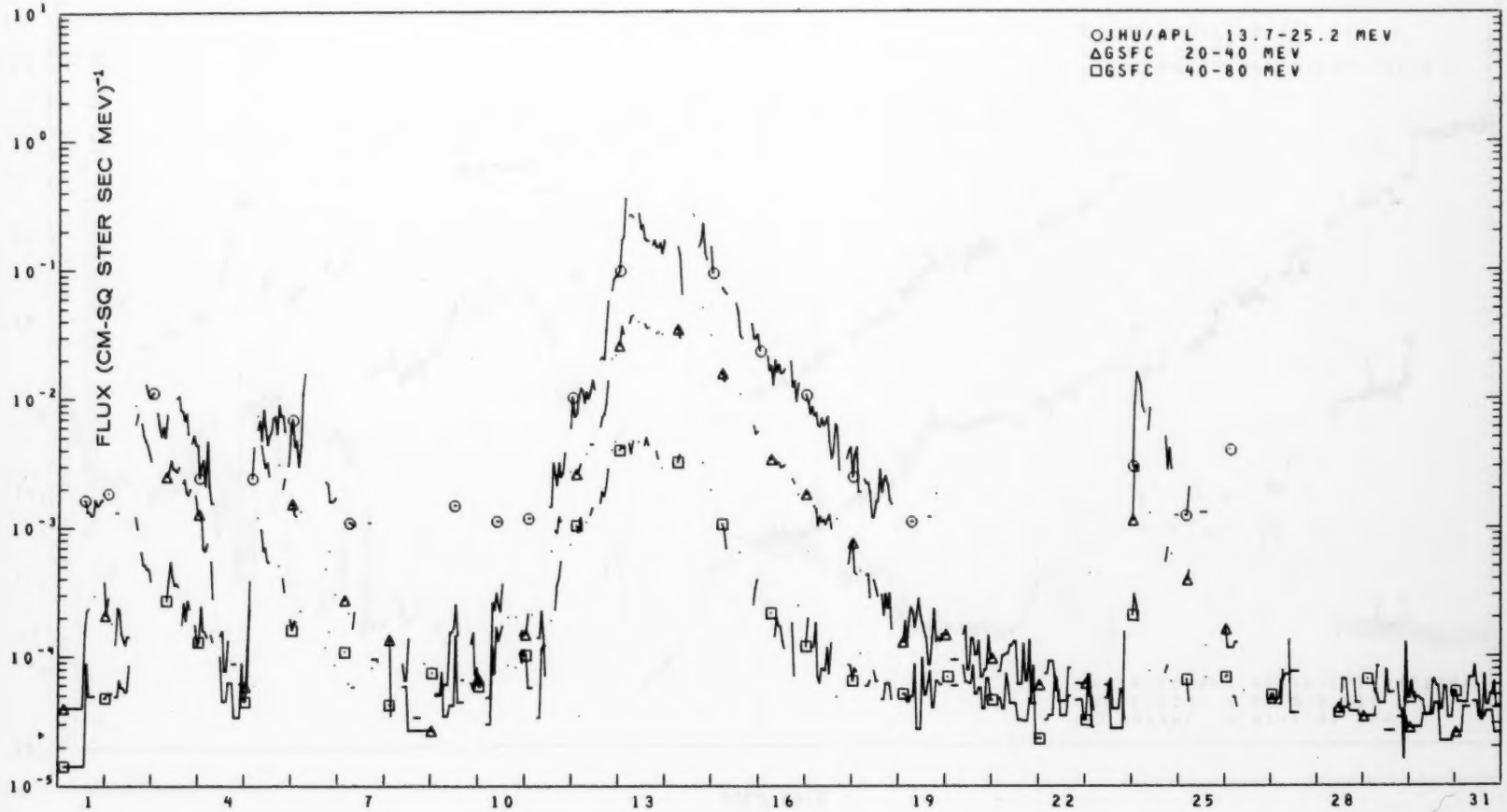
JULY 1978



65
Jul 78

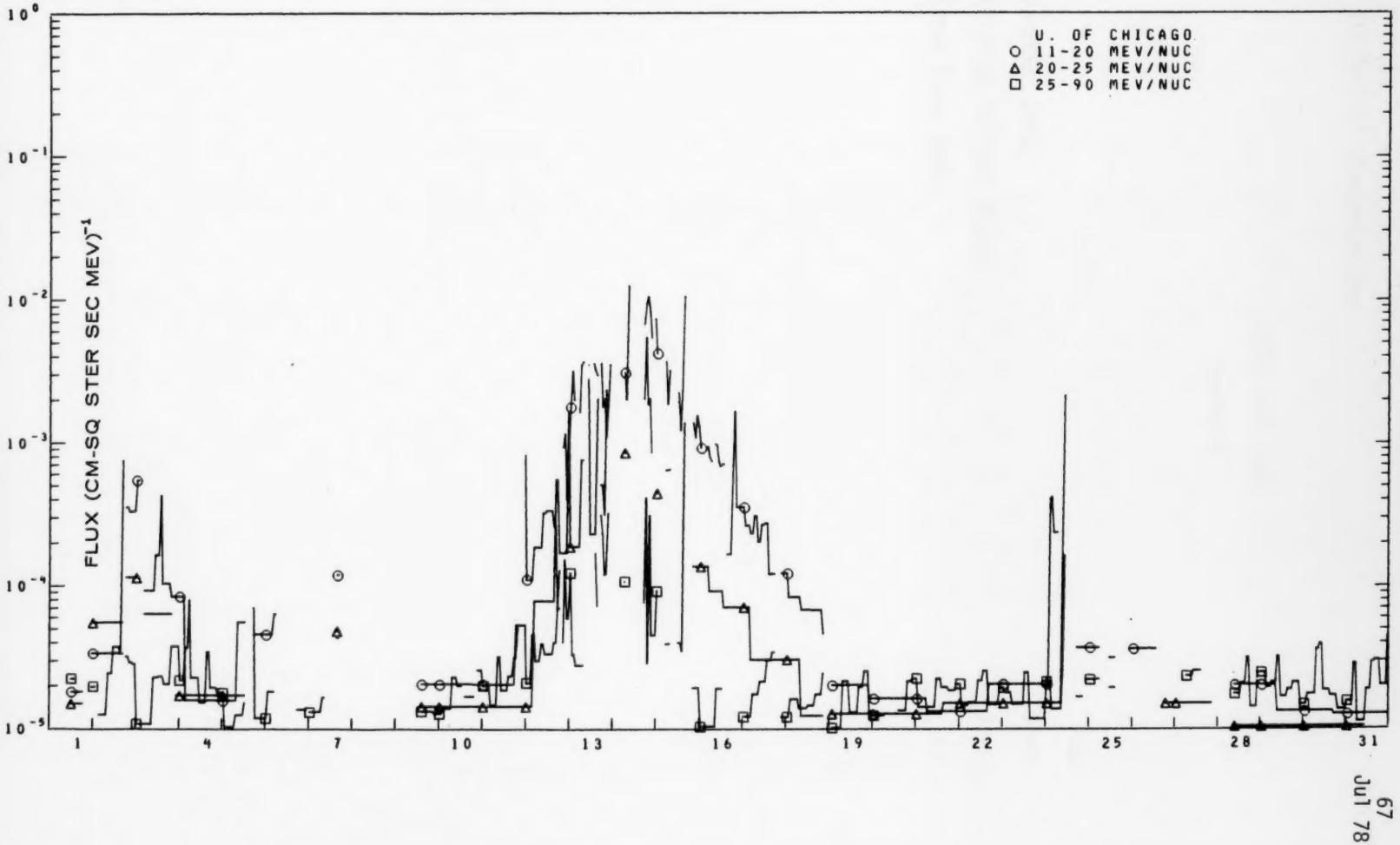
IMP 7 AND 8 HIGH ENERGY PROTONS

JULY 1978



IMP 7 AND 8 ALPHA PARTICLES

JULY 1978



JUNE 1978 DATA

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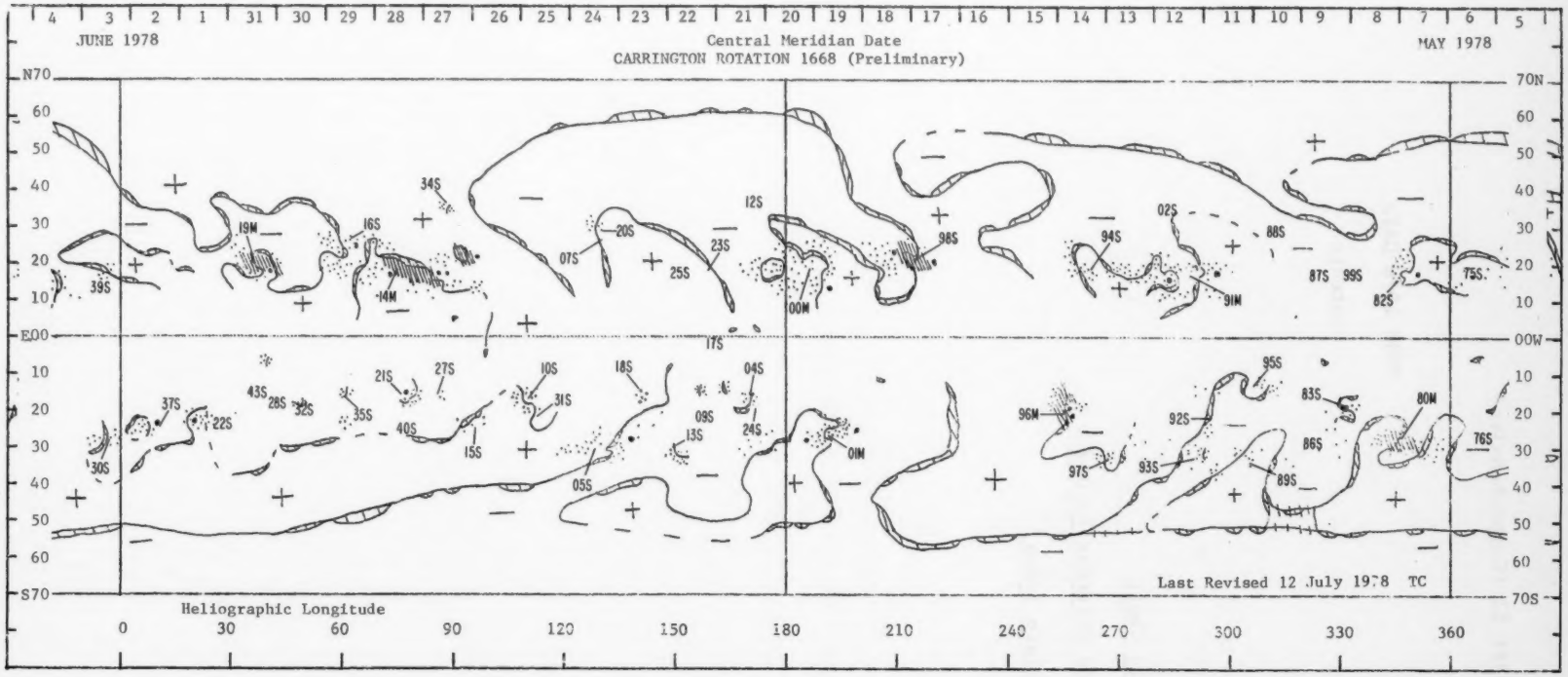
Regional Flare Index	80

ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

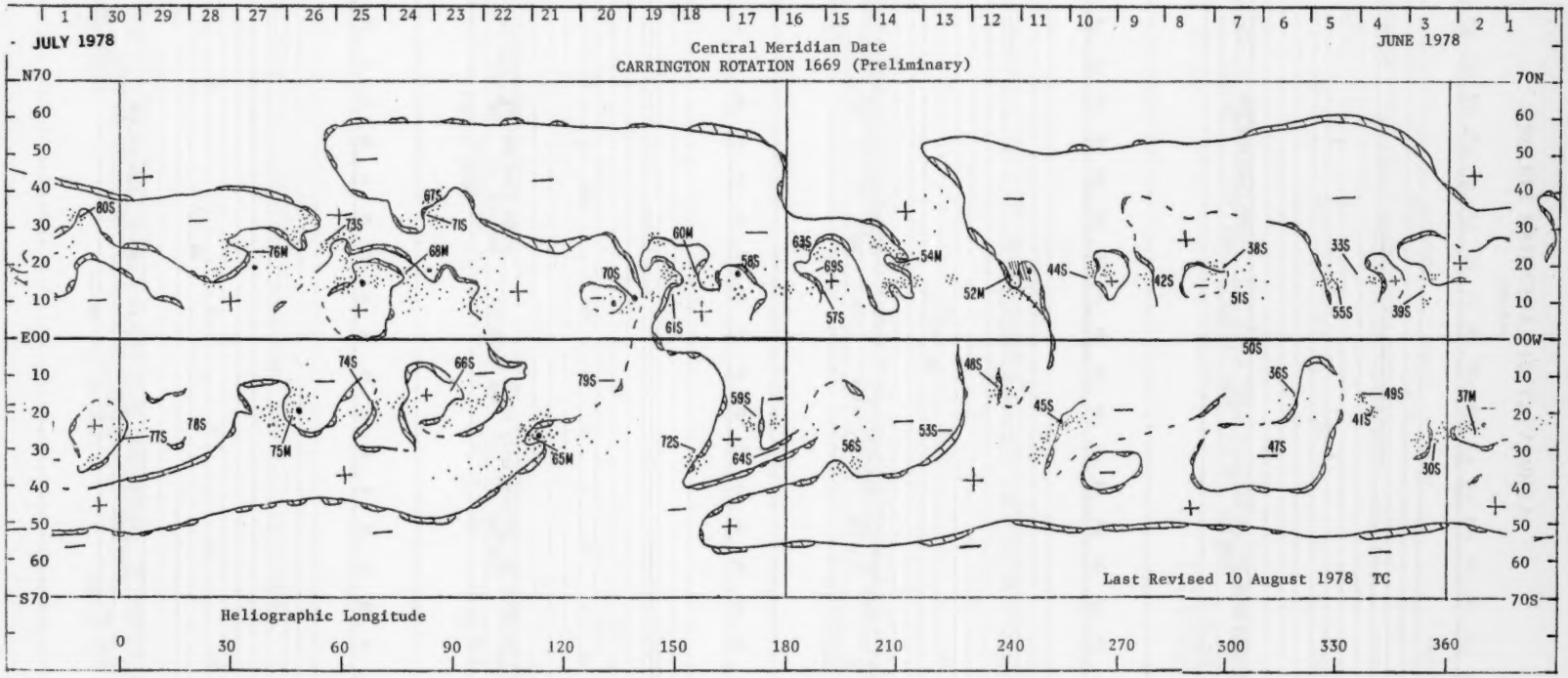
MAY - JUNE 1978



ABBREVIATED CALENDAR RECORD

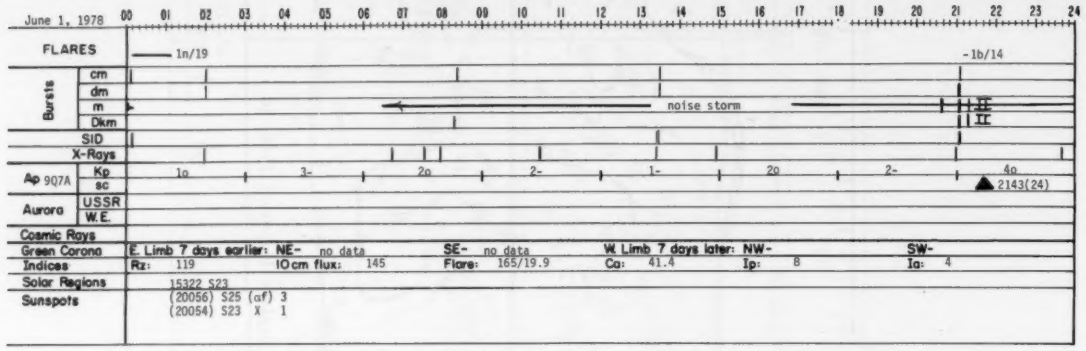
Hα SYNOPTIC CHART

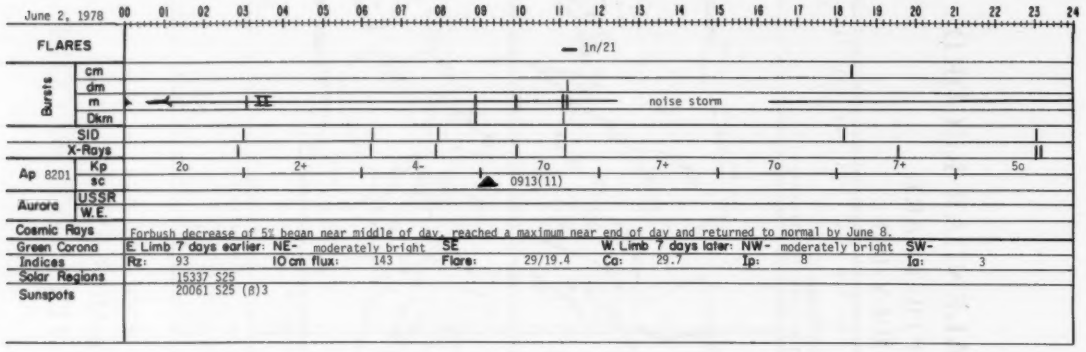
JUNE - JULY 1978

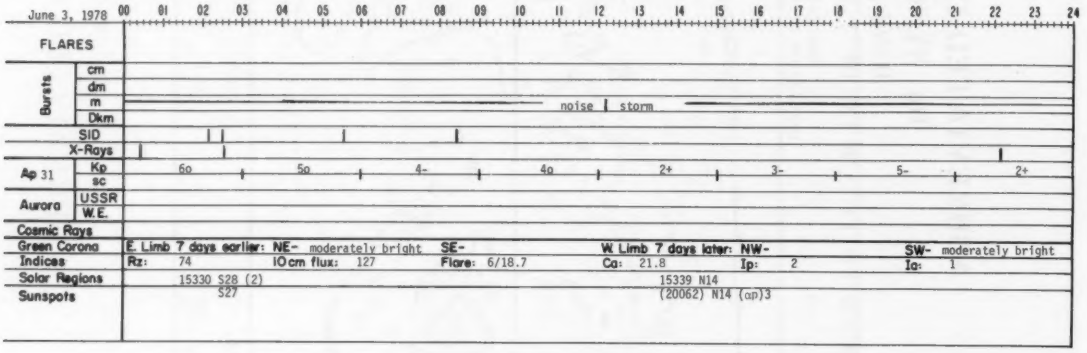


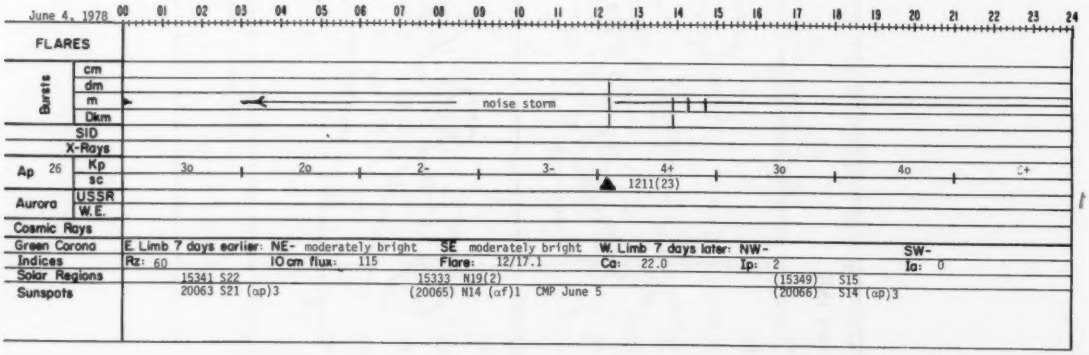
ABBREVIATED CALENDAR RECORD

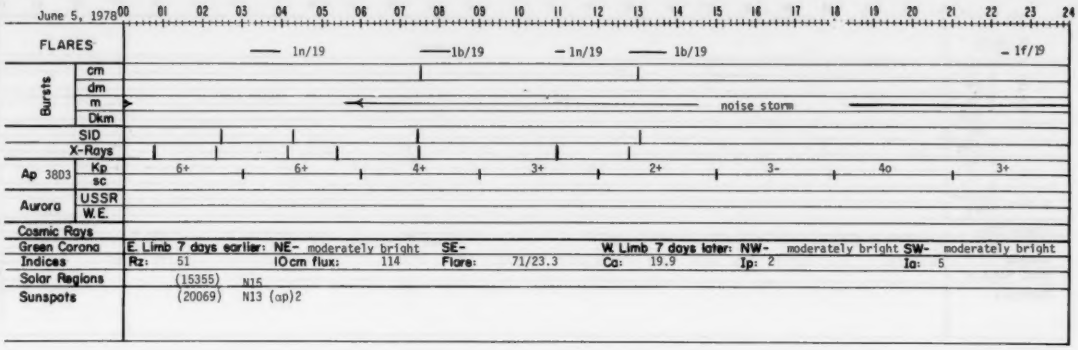
JUNE 1978

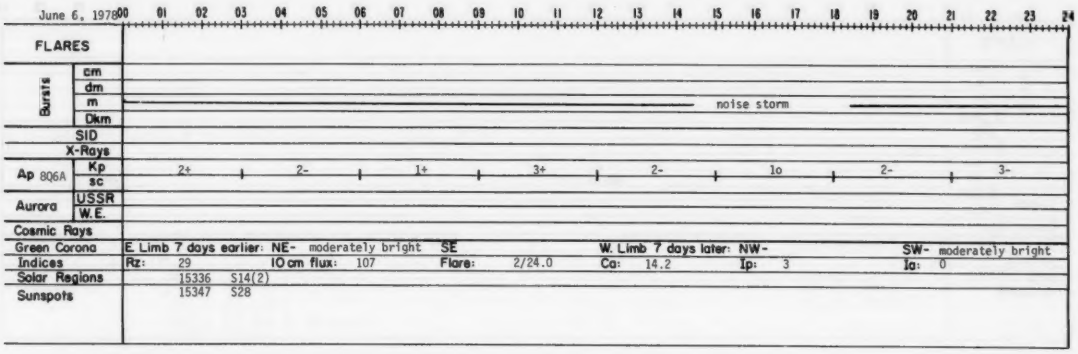


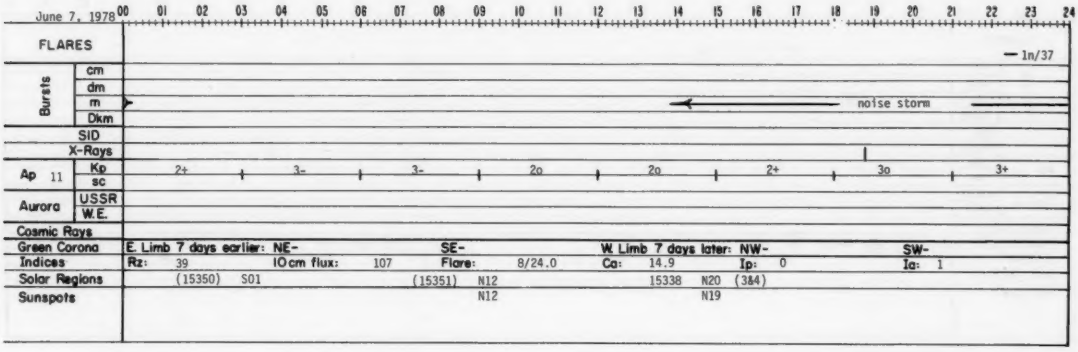

June 2, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/21
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 8201
Kp
2o 2+ 4- 7o 7+ 7o 7+ 5o
sc
0913(11)
Aurora
USSR
W.E.
Cosmic Rays
Forbush decrease of 5% began near middle of day, reached a maximum near end of day and returned to normal by June 8.
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- moderately bright SW-
Indices
Rz: 93 10cm flux: 143 Flare: 29/19.4 Ca: 29.7 Ip: 8 Ia: 3
Solar Regions
15337 S25
Sunspots
20061 S25 (β)3

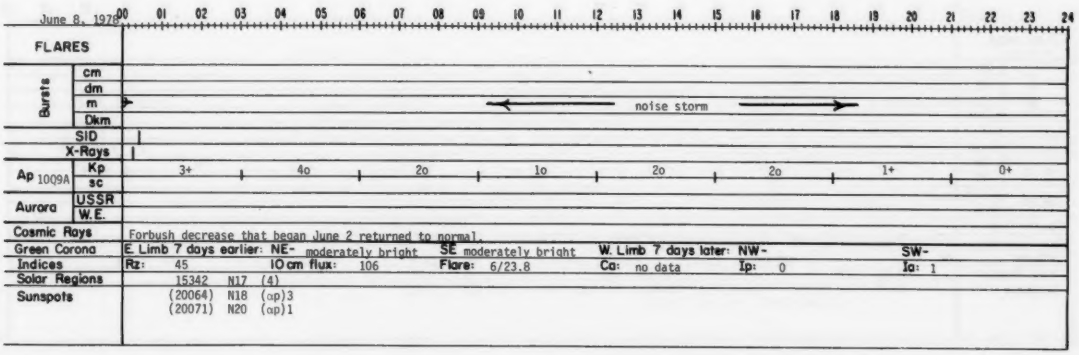





June 5, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/19
1b/19
1n/19
1b/19
1f/19
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 3803
Kp
sc
6+ 6+ 4+ 3+ 2+ 3- 4o 3+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 51 10 cm flux: 114 Flare: 71/23.3 Ca: 19.9 Ip: 2 Ia: 5
Solar Regions
(15355) N15
Sunspots
(20069) N13 (αp)2


June 6, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 806A
Kp
sc
2+ 2- 1+ 3+ 2- 1o 2- 3-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 29 10 cm flux: 107 Flare: 2/24.0 Ca: 14.2 Ip: 3 Ia: 0
Solar Regions
15336 S14(2)
Sunspots
15347 S28


June 7, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/37
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 11
Kp
sc
2+ 3- 3- 2o 2o 2+ 3o 3+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE-
W. Limb 7 days later: NW- SW-
Indices
Rz: 39 10 cm flux: 107 Flare: 8/24.0 Ca: 14.9 Ip: 0 Ia: 1
Solar Regions
(15350) S01 (15351) N12 15338 N20 (3&4)
Sunspots
N12 N19


June 8, 1978
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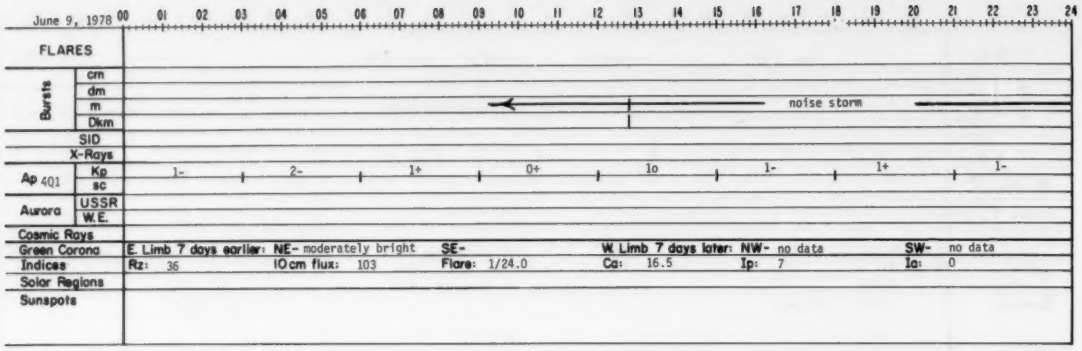
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 1009A
Kp
sc
3+ 4o 2o 1o 2o 2o 1+ 0+
Aurora
USSR
W.E.
Cosmic Rays
Forbush decrease that began June 2 returned to normal.
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE moderately bright
W. Limb 7 days later: NW- SW-
Indices
Rz: 45 10 cm flux: 106 Flare: 6/23.8 Ca: no data Ip: 0 Ia: 1
Solar Regions
15342 N17 (4)
Sunspots
(20064) N18 (αp)3
(20071) N20 (αp)1


June 9, 1978
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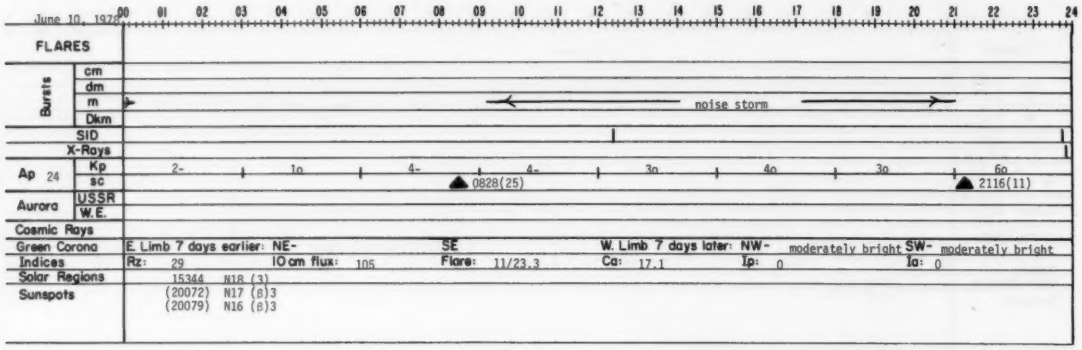
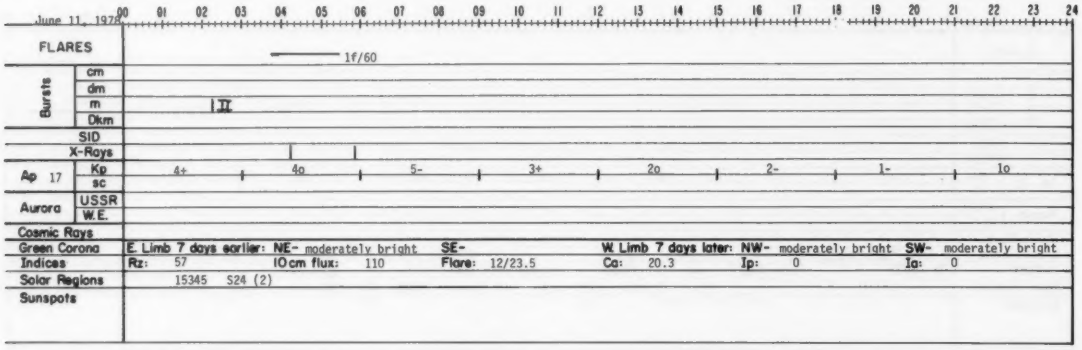
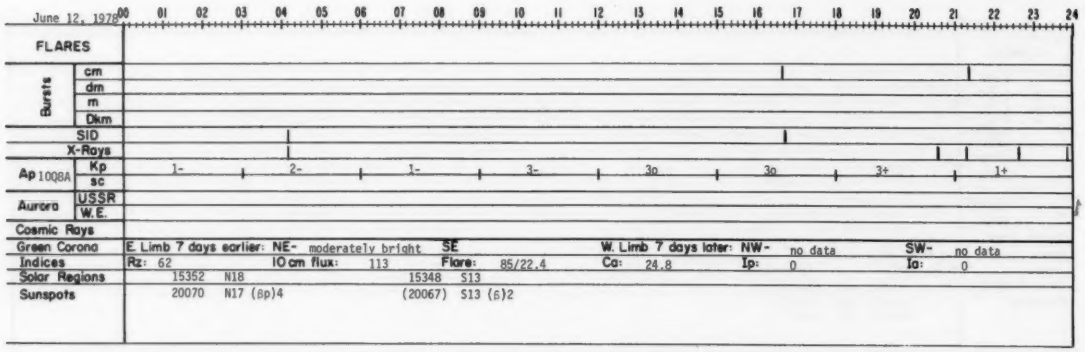
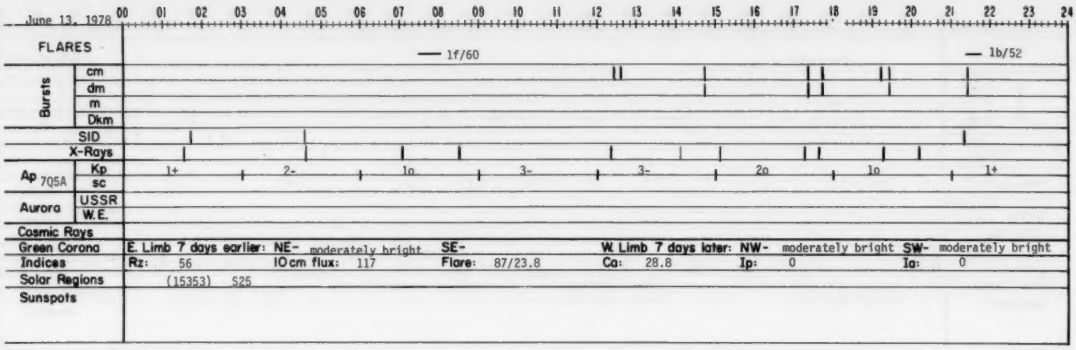
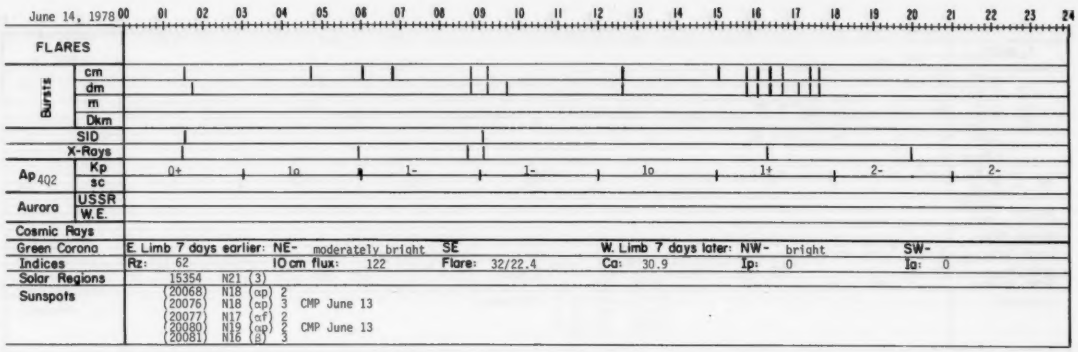
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 401
Kp
sc
1- 2- 1+ 0+ 1o 1- 1+ 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 36 10cm flux: 103 Flare: 1/24.0 Ca: 16.5 Ip: 7 Ia: 0
Solar Regions
Sunspots

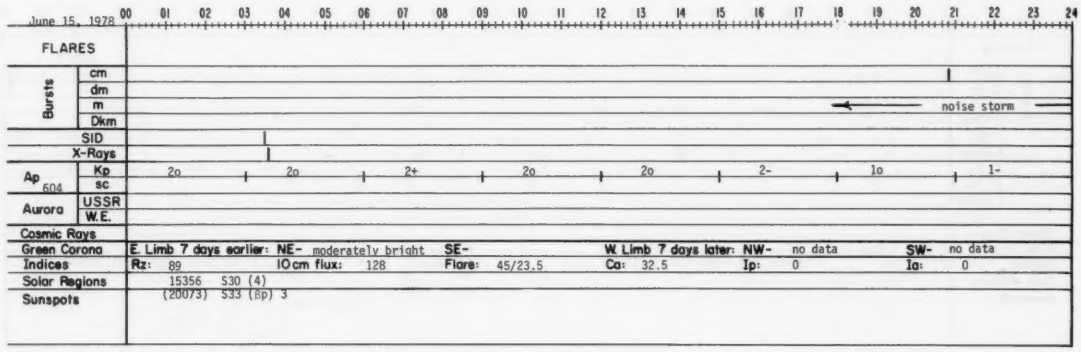

June 10, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 24
Kp
sc
2- 1o 4- 4- 3o 4o 3o 6o
0828(25)
2116(11)
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE
W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 29 10cm flux: 105 Flare: 11/23.3 Ca: 17.1 Ip: 0 Ia: 0
Solar Regions
15344 N18 (3)
Sunspots
(20072) N17 (β)3
(20079) N16 (β)3

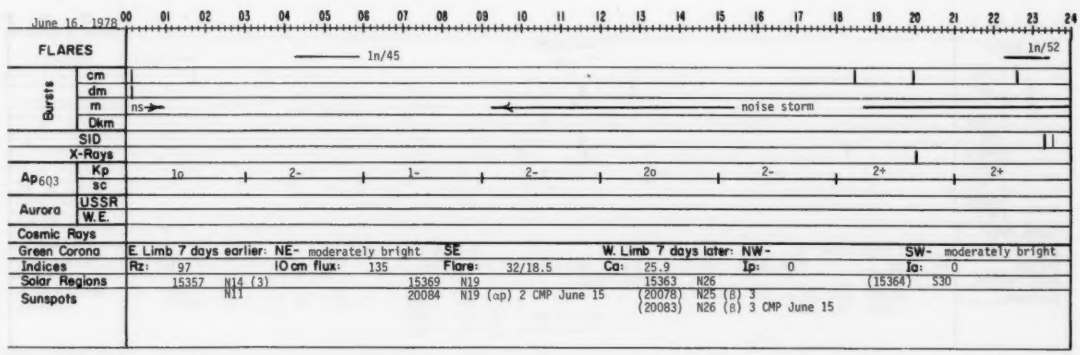

June 11, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1f/60
Bursts
cm
dm
m
II
Dkm
SID
X-Rays
Ap 17
Kp
sc
4+ 4o 5- 3+ 2o 2- 1- 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 57 10cm flux: 110 Flare: 12/23.5 Ca: 20.3 Ip: 0 Ia: 0
Solar Regions
15345 S24 (2)
Sunspots

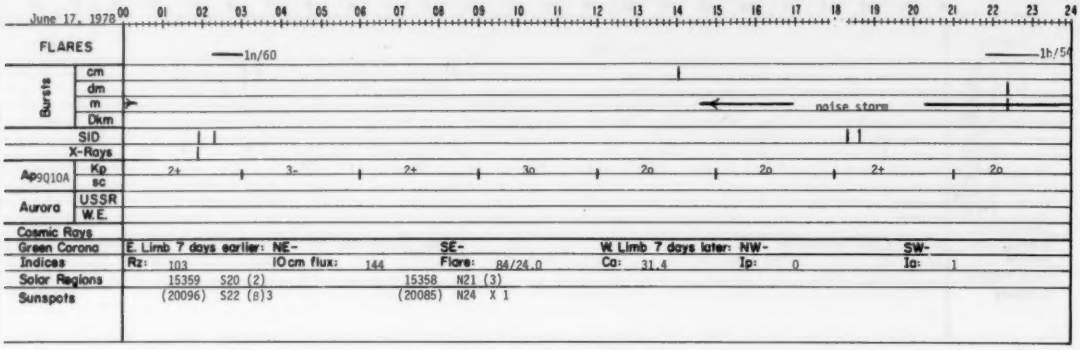

June 12, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 10Q8A
Kp
sc
1- 2- 1- 3- 3o 3o 3+ 1+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 62 10cm flux: 113 Flare: 85/22.4 Ca: 24.8 Ip: 0 Ia: 0
Solar Regions
15352 N18 15348 S13
Sunspots
20070 N17 (βp)4 (20067) S13 (β)2

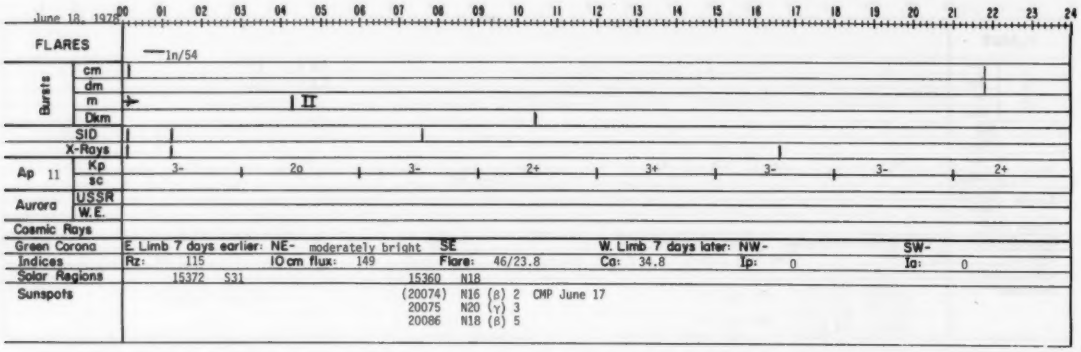

June 13, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1f/60
1b/52
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 705A
Kp
sc
1+ 2- 1o 3- 3- 2o 1o 1+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 56 10cm flux: 117 Flare: 87/23.8 Ca: 28.8 Ip: 0 Ia: 0
Solar Regions
(15353) S25
Sunspots

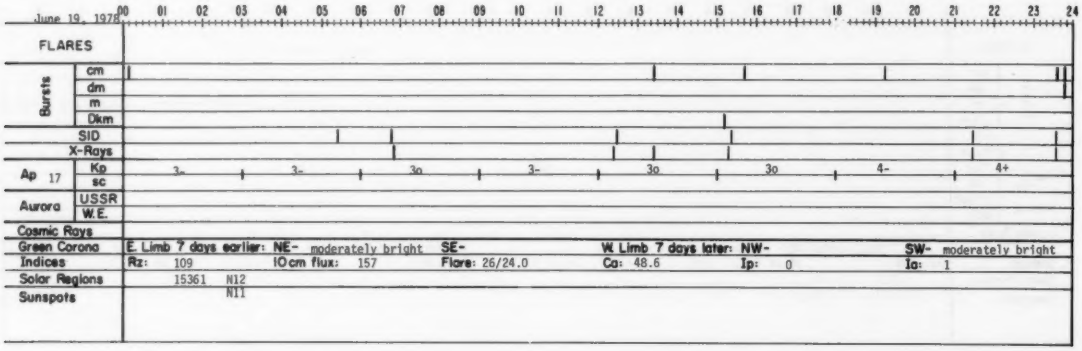

June 14, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 402
Kp
sc
0+ 1o 1- 1- 1o 1+ 2- 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- bright SW-
Indices
Rz: 62 10cm flux: 122 Flare: 32/22.4 Ca: 30.9 Ip: 0 Ia: 0
Solar Regions
15354 N21 (3)
Sunspots
(20068) N18 (ap) 2
(20076) N18 (ap) 3 CMP June 13
(20077) N17 (af) 2
(20080) N19 (ap) 2 CMP June 13
(20081) N16 (β) 3

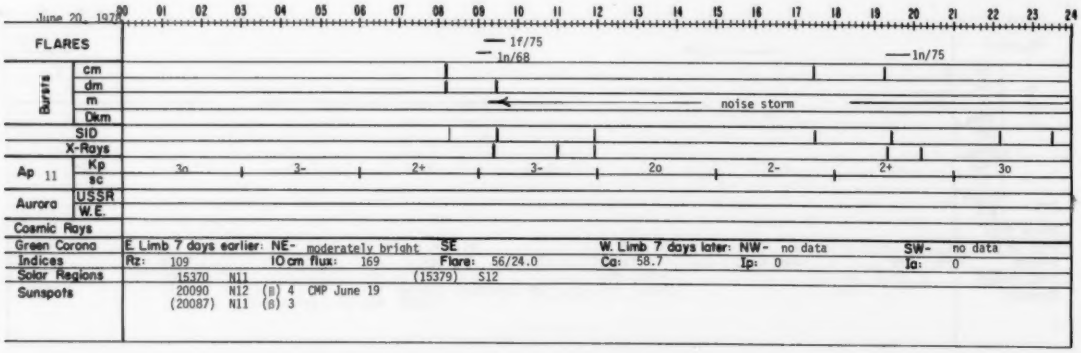

June 15, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 604
Kp
sc
2o 2o 2+ 2o 2o 2- 1o 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 89 10cm flux: 128 Flare: 45/23.5 Ca: 32.5 Ip: 0 Ia: 0
Solar Regions
15356 S30 (4)
Sunspots
(20073) S33 (βp) 3

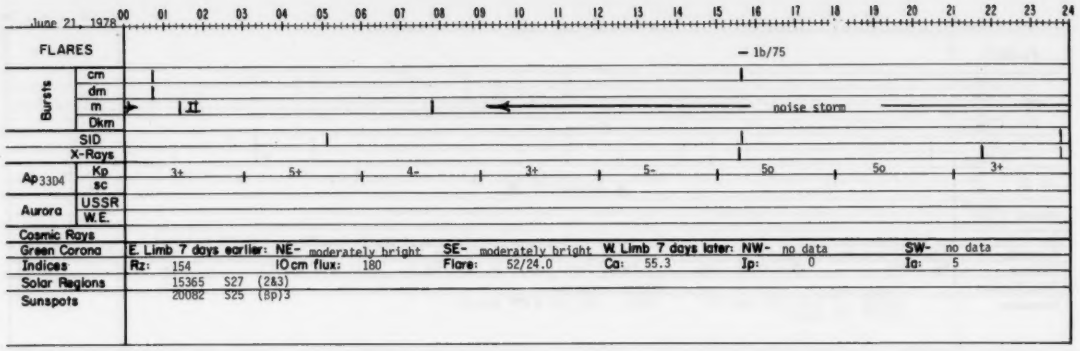

June 16, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/45
1n/52
Bursts
cm
dm
m
ns
noise storm
Dkm
SID
X-Rays
Ap 603
Kp
sc
1o 2- 1- 2- 2o 2- 2+ 2+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 97 10cm flux: 135 Flare: 32/18.5 Ca: 25.9 Ip: 0 Ia: 0
Solar Regions
15357 N14 (3)
N11
15369 N19
20084 N19 (ap) 2 CMP June 15
15363 N26
(20078) N25 (β) 3
(20083) N26 (β) 3 CMP June 15
(15364) S30
Sunspots

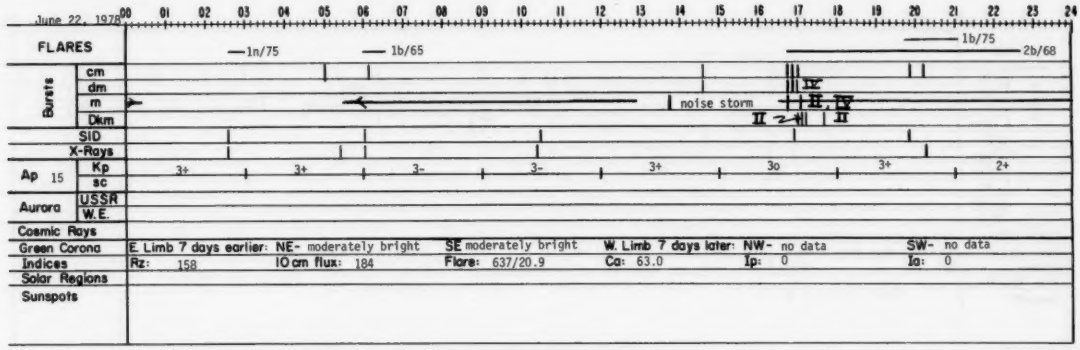

June 17, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/60
1b/54
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 9010A
Kp
sc
2+ 3- 2+ 3o 2o 2o 2+ 2o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE-
W. Limb 7 days later: NW- SW-
Indices
Rz: 103 10cm flux: 144 Flare: 84/24.0 Ca: 31.4 Ip: 0 Ia: 1
Solar Regions
15359 S20 (2) 15358 N21 (3)
Sunspots
(20096) S22 (β)3 (20085) N24 X 1

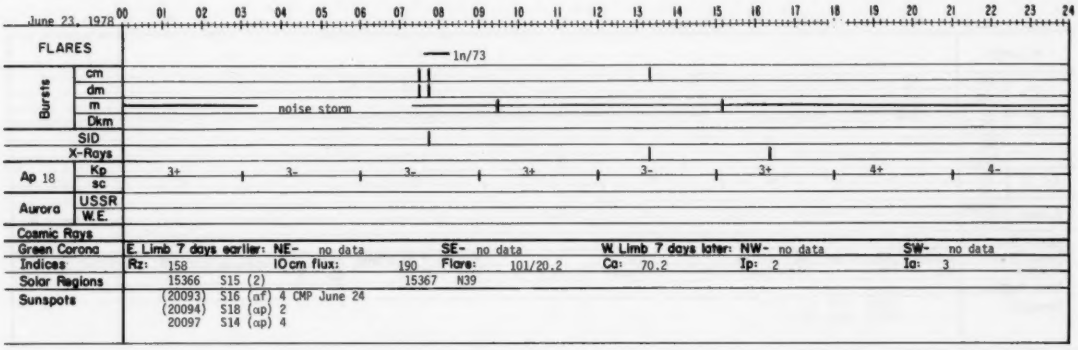

June 18, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/54
Bursts
cm
dm
m
II
Dkm
SID
X-Rays
Ap 11
Kp
sc
3- 2o 3- 2+ 3+ 3- 3- 2+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- SW-
Indices
Rz: 115 10cm flux: 149 Flare: 46/23.8 Ca: 34.8 Ip: 0 Ia: 0
Solar Regions
15372 S31 15360 N18
Sunspots
(20074) N16 (β) 2 CMP June 17
20075 N20 (γ) 3
20086 N18 (β) 5

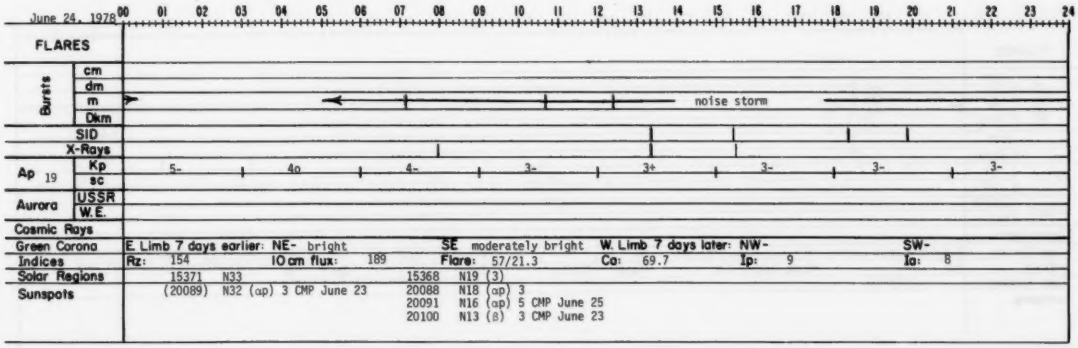

June 19, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 17
Kp
sc
3- 3- 3o 3- 3o 3o 4- 4+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 109 10cm flux: 157 Flare: 26/24.0 Ca: 48.6 Ip: 0 Ia: 1
Solar Regions
15361 N12
N11
Sunspots

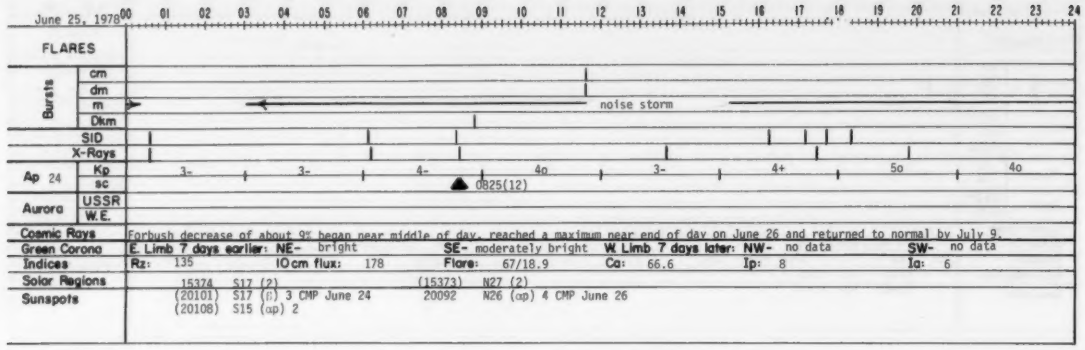

June 20, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1f/75
1n/68
1n/75
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 11
Kp
sc
3o 3- 2+ 3- 2o 2- 2+ 3o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 109 10cm flux: 169 Flare: 56/24.0 Ca: 58.7 Ip: 0 Ia: 0
Solar Regions
15370 N11 (15379) S12
Sunspots
20090 N12 (β) 4 CMP June 19
(20087) N11 (β) 3

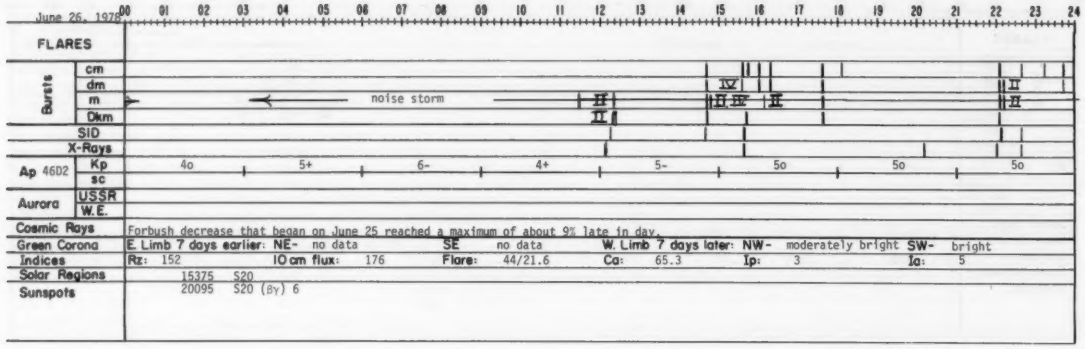

June 21, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1b/75
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 33D4
Kp
3+ 5+ 4- 3+ 5- 5o 5o 3+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE- moderately bright W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 154 10cm flux: 180 Flare: 52/24.0 Ca: 55.3 Ip: 0 Ia: 5
Solar Regions
15365 S27 (2&3)
Sunspots
20082 S25 (Bp)3

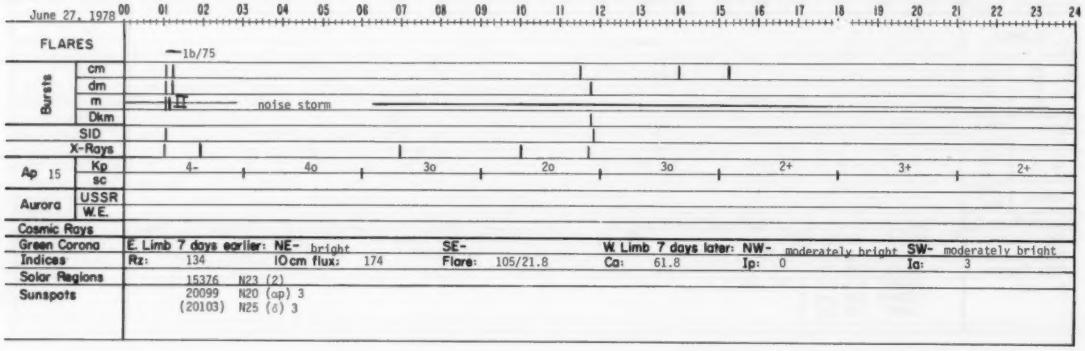

June 22, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/75
1b/65
1b/75
2b/68
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 15
Kp
3+ 3+ 3- 3- 3+ 3o 3+ 2+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE moderately bright W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 158 10cm flux: 184 Flare: 637/20.9 Ca: 63.0 Ip: 0 Ia: 0
Solar Regions
Sunspots

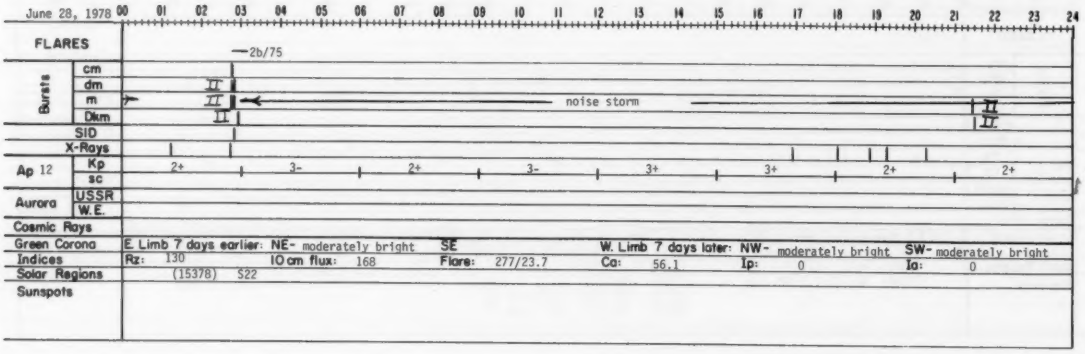

June 23, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/73
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 18
Kp
3+ 3- 3- 3+ 3- 3+ 4+ 4-
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 158 10cm flux: 190 Flare: 101/20.2 Ca: 70.2 Ip: 2 Ia: 3
Solar Regions
15366 S15 (2) 15367 N39
Sunspots
(20093) S16 (af) 4 CMP June 24
(20094) S18 (ap) 2
20097 S14 (ap) 4

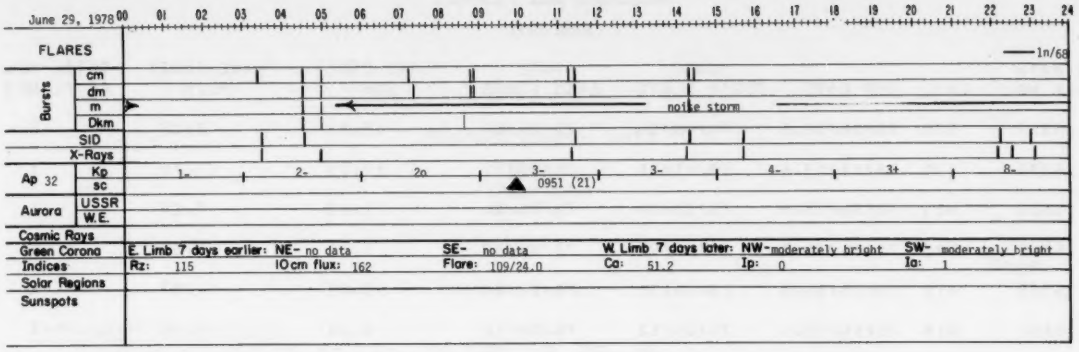

June 24, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 19
Kp
5- 4o 4- 3- 3+ 3- 3- 3-
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- bright SE moderately bright W. Limb 7 days later: NW- SW-
Indices
Rz: 154 10cm flux: 189 Flare: 57/21.3 Ca: 69.7 Ip: 9 Ia: 8
Solar Regions
15371 N33 15368 N19 (3)
Sunspots
(20089) N32 (ap) 3 CMP June 23
20088 N18 (ap) 3
20091 N16 (ap) 5 CMP June 25
20100 N13 (B) 3 CMP June 23

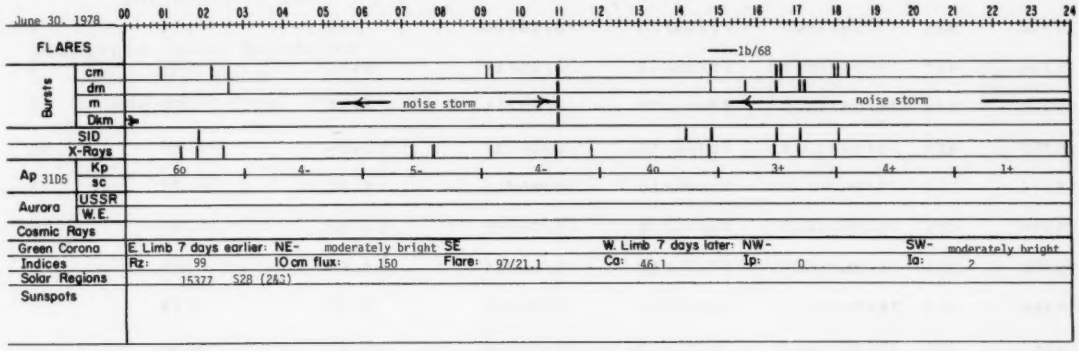

June 25, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 24
Kp
3- 3- 4- 4o 3- 4+ 5o 4o
sc
0825(12)
Aurora
USSR
W.E.
Cosmic Rays
Forbush decrease of about 9% began near middle of day, reached a maximum near end of day on June 26 and returned to normal by July 9.
Green Corona
E. Limb 7 days earlier: NE- bright SE- moderately bright W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 135 10 cm flux: 178 Flare: 67/18.9 Ca: 66.6 Ip: 8 Ia: 6
Solar Regions
15374 S17 (2) (15373) N27 (2)
Sunspots
(20101) S17 (β) 3 CMP June 24 20092 N26 (αp) 4 CMP June 26
(20108) S15 (αp) 2


June 26, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 46D2
Kp
4o 5+ 6- 4+ 5- 5o 5o 5o
sc
Aurora
USSR
W.E.
Cosmic Rays
Forbush decrease that began on June 25 reached a maximum of about 9% late in day.
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- moderately bright SW- bright
Indices
Rz: 152 10 cm flux: 176 Flare: 44/21.6 Ca: 65.3 Ip: 3 Ia: 5
Solar Regions
15375 S20
Sunspots
20095 S20 (βγ) 6


June 27, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1b/75
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 15
Kp
4- 4o 3o 2o 3o 2+ 3+ 2+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- bright SE- W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 134 10 cm flux: 174 Flare: 105/21.8 Ca: 61.8 Ip: 0 Ia: 3
Solar Regions
15376 N23 (2)
Sunspots
20099 N20 (αp) 3
(20103) N25 (δ) 3


June 28, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
2b/75
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 12
Kp
2+ 3- 2+ 3- 3+ 3+ 2+ 2+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 130 10 cm flux: 168 Flare: 277/23.7 Ca: 56.1 Ip: 0 Ia: 0
Solar Regions
(15378) S22
Sunspots


June 29, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/68
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 32
Kp
sc
1- 2- 2o 3- 0951 (21) 3- 4- 3+ 8-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 115 10 cm flux: 162 Flare: 109/24.0 Ca: 51.2 Ip: 0 Ia: 1
Solar Regions
Sunspots


June 30, 1978
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1b/68
Bursts
cm
dm
m
Dkm
noise storm
noise storm
SID
X-Rays
Ap 3105
Kp
sc
6o 4- 5- 4- 4o 3+ 4+ 1+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 99 10 cm flux: 150 Flare: 97/21.1 Ca: 46.1 Ip: 0 Ia: 2
Solar Regions
15377 S28 (2&2)
Sunspots

REGIONAL FLARE INDEX

INCLUDES ALL FLARES

JUNE 1978

MC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
15337	S25	78/06/02.5	78/06/04	78/06/09	12.81	2.13	7
15330	S28	78/06/03.4	78/05/30	78/05/30	17.79	17.79	1
15339	N14	78/06/03.6	78/06/04	78/06/04	7.10	7.10	1
15341	S22	78/06/04.8	78/06/02	78/06/02	3.96	3.96	1
15333	N18	78/06/05.0	78/05/31	78/06/10	10.65	.97	4
15355	N15	78/06/05.4	78/06/12	78/06/12	0.00	0.00	1
15351	N12	78/06/07.3	78/06/11	78/06/11	1.92	1.92	1
15342	N18	78/06/09.0	78/06/06	78/06/06	.21	.21	1
15344	N18	78/06/10.5	78/06/07	78/06/14	5.80	.73	3
15345	S24	78/06/11.0	78/06/08	78/06/16	7.07	.79	2
15352	N18	78/06/12.0	78/06/10	78/06/18	212.84	23.65	55
15348	S13	78/06/12.2	78/06/10	78/06/10	5.31	5.31	1
15354	N21	78/06/14.3	78/06/08	78/06/21	68.52	4.89	15
15356	S30	78/06/15.5	78/06/11	78/06/19	3.64	.40	3
15369	N19	78/06/16.1	78/06/17	78/06/18	6.76	3.38	2
15363	N26	78/06/16.2	78/06/15	78/06/19	25.18	5.04	7
15359	S20	78/06/17.2	78/06/21	78/06/21	1.90	1.90	1
15358	N23	78/06/17.4	78/06/20	78/06/20	0.00	0.00	1
15360	N18	78/06/18.7	78/06/11	78/06/24	134.74	9.62	35
15361	N12	78/06/19.0	78/06/15	78/06/15	.84	.84	1
15370	N12	78/06/20.3	78/06/20	78/06/26	43.21	6.17	12
15379	S12	78/06/20.4	78/06/25	78/06/25	2.09	2.09	2
15365	S29	78/06/22.0	78/06/16	78/06/25	59.83	5.98	11
15366	S15	78/06/23.6	78/06/16	78/06/22	24.68	3.53	13
15371	N33	78/06/24.2	78/06/17	78/06/22	4.67	.78	2
15368	N18	78/06/24.5	78/06/19	78/07/02	692.07	49.43	50
15374	S17	78/06/25.2	78/06/19	78/06/28	9.58	.96	4
15373	N27	78/06/26.1	78/06/20	78/07/02	74.16	5.70	19
15375	S20	78/06/26.7	78/06/19	78/07/02	435.01	31.07	59
15376	N23	78/06/27.6	78/06/22	78/07/01	184.24	18.42	53
15377	S27	78/06/30.5	78/06/28	78/06/28	3.38	3.38	1

Miscellaneous Data

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GEOMAGNETIC ACTIVITY INDICES

OCTOBER 1978

Day		Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa *				Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M		
1		3-	2+	2+	3-	3	3-	3+	3+	22+	3-	2+	2+	2+	3-	2+	3-	4-	13	23	25	20	29	0.8
2		2-	3-	2-	3	3+	3	3-	3	21	2-	2+	1	2+	3	3	3-	2+	12	22	18	14	27	0.7
3		3-	2+	3	2-	2-	1	1+	2-	15+	3-	1+	2-	2+	2	2-	1+	2-	8	15	14	17	12	0.4
4		4	4-	4-	3	3+	2	3-	3	25+	4-	3+	3+	3-	3	2-	3	3-	17	29	20	29	21	0.9
5		4-	2+	1	2	1+	2	1+	1	15-	3-	1+	0+	1+	1	2	2-	1+	8	15	9	13	12	KK	0.4
6	Q1	1	1	1	0	1-	2	1-	2-	8	1	1+	2-	1-	1	2-	1	2-	4	8	7	6	10	CC	0.1
7	Q3	2-	2-	1+	1	1+	0+	1	1-	9	1	1+	1+	1-	1+	1-	1-	1	4	8	8	10	7	CC	0.2
8	Q8	0	2	1+	2	1+	1	1	2+	11	0+	2	1	2-	1+	2-	1+	3-	5	10	12	10	12	CK	0.2
9		1+	3-	2-	3	2	2	3-	4-	19	1-	3	2+	3-	2+	3-	3	4-	11	21	25	19	27		0.6
10		4+	4-	2+	3+	3	0+	2	3-	22-	3	3-	2	3+	3-	1-	3-	3-	15	29	21	34	16		0.8
11	Q9	2	2+	2	2-	1-	1-	0+	1+	11	2-	2-	2+	1+	1	1-	1-	1+	5	11	8	13	7	CK	0.2
12		1+	1+	1-	3+	4	4	3	3-	20+	2-	2-	1	4-	5-	4	2+	3	14	21	33	17	37		0.8
13		3	2+	2+	1+	2-	1-	2+	2+	16	3	2+	3	2-	2-	1-	2+	3-	8	15	17	21	11		0.4
14	Q5	1-	1	1	1-	0+	2	2+	2-	10-	1+	1	1	1-	1-	2	3-	2-	5	9	9	5	13	CC	0.2
15	Q4	1+	0+	1	1+	2+	1	1	2-	10	2-	0+	1+	2-	3-	1+	1	2	5	9	11	7	14	CC	0.2
16	Q2	2	2	1-	1-	1+	0+	0+	1-	8	2	2-	1-	1	1+	0+	0+	1	4	8	7	9	6	CC	0.1
17	Q6	0+	1+	1	1	1-	1-	2+	3-	10	1-	2-	1	1-	0+	1	2	3+	5	11	11	7	16	K	0.2
18	D1	4+	5+	5	4-	3+	3+	4+	4	33+	5-	4+	5-	3+	3	3+	3+	4-	32	52	43	53	41		1.3
19	D4	4	4-	4+	4-	4	2+	4-	3	29-	3-	3+	4	3	3+	3	3+	3-	22	40	33	39	34		1.1
20		3-	3-	2+	3-	3-	2	2	1	18	2+	2-	1+	3	3-	3	2+	2	9	13	20	16	18		0.5
21		1	3	2+	3+	3+	2	3	3	21	1+	2+	2+	3-	3	2	3	3	13	22	20	15	28		0.7
22		2-	3+	3-	2+	2	3-	2+	1-	18-	2-	2+	2+	2+	2	3	3-	2-	10	19	20	19	21		0.5
23	Q8	0+	3-	2+	2-	1+	1	1-	1+	11+	1	2+	2-	2	1+	1+	1-	2-	6	11	11	12	10	CK	0.3
24	Q7	2	2+	1	0+	0	1	2+	1+	10+	2	1+	0+	1-	0+	1-	3-	2-	5	11	8	8	12	CC	0.2
25		1	1	1-	2+	3	3-	2-	1-	13	1	1	1-	3-	3	3-	2+	1+	7	10	15	10	16	KK	0.4
26		2-	2	2	2-	3	3+	5-	5	23+	2-	2	2	2-	3+	4	5-	4+	18	34	29	13	50		1.0
27	D3	4	4+	5+	4+	3	2	1+	3-	27	3+	3	4+	4+	3+	3-	1+	3-	23	35	40	54	21		1.1
28		3-	4-	4+	3	2	2+	1	3-	22-	2+	3-	3+	2	2+	3	2-	3-	14	28	20	24	25		0.8
29		3-	2+	2	3	4	4+	3+	3-	24+	2+	2	1+	3-	4	5	4-	3	16	31	30	17	45		0.9
30	D2	2-	3+	4-	5-	4-	5-	4+	4-	30-	1+	3-	3-	4	4+	5	4	3+	25	40	49	28	62		1.2
31	D5	4-	4-	3-	2+	4	4	4-	3+	27+	2	2	2+	3-	4	5-	4-	3+	20	41	34	22	53		1.0
																			12	21.0	20.2	20.9			0.59

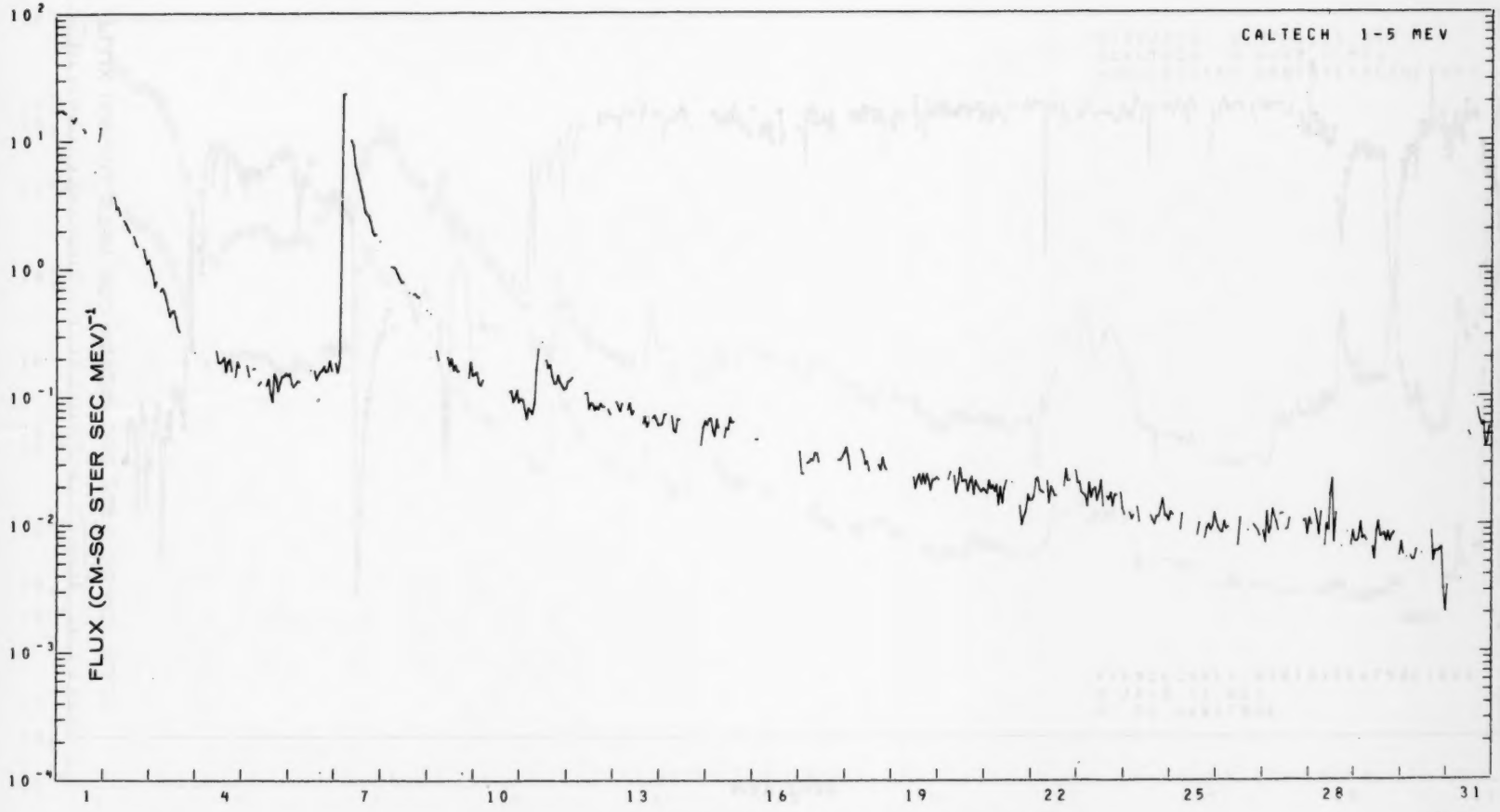
Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	3-	2	2+	3-	3	2+	3-	3+	2+	2-	2+	3	3+	2	3-	3
2	2-	2	1	3-	3+	3	3-	2+	1+	2	1	3-	4-	3+	3-	3-
3	2+	1+	2+	2+	2+	1+	1+	2-	2+	1+	3-	2+	2+	1+	1	1+
4	3+	3+	3	3-	3+	2-	3	3	3+	3	3	3	3+	2-	3	3
5	3-	1+	0+	2-	1+	2+	2-	1+	3-	1+	1-	2	1+	2+	2-	1
6	1-	1	1+	0+	1	2	1	2-	1-	1-	1+	0+	1-	2	1-	2-
7	1	1	1	1	1+	1-	1-	1	1-	1	1	1	1+	0+	1	1-
8	0+	2-	1	2-	1+	2-	1+	3-	0+	2-	1	2	1+	2-	1+	2+
9	1	3	2+	3-	2+	2+	3	4-	1	3-	2	3-	2+	2+	3	4-
10	3	3-	2	3	3-	1-	2+	2+	3+	3-	2	3-	3-	1-	2-	2
11	2-	2-	2	1+	1+	1	1-	1+	1+	1+	2-	2-	1+	1	2-	1+
12	1+	1+	1	3+	4+	4	2+	3-	1+	1	2-	3-	4	4	3+	3-
13	3	2	3-	1+	2-	1	2+	3-	3-	2-	3-	1+	1+	1	2+	2+
14	1	1	1	1-	1-	2	2+	2-	1	1	1	1-	1-	2	2	2-
15	1+	0+	1	2-	3-	1+	1	2-	1+	0+	1	2-	3-	1+	1	2-
16	2	2-	1-	1	1+	1-	0+	1-	2-	2-	1-	1-	1+	1-	0	1-
17	0+	2-	1	0+	0+	1-	2	3+	0	1+	1	0+	0+	1-	2	3
18	4+	4+	4	3	3	4-	4-	3+	4-	4	4-	3	3-	4-	4	3+
19	3	3+	4-	3	4-	3-	3	3-	3	3	4-	3	4-	3-	3	3-
20	2+	2-	1+	3-	3-	3-	2	2-	2	2-	1+	3-	3-	2	2	1+
21	1+	2+	2	3	3+	2	3	3	1+	2+	2-	3+	3+	2+	3	3
22	2-	2+	3-	3-	2-	3	3-	1+	1+	3-	3-	3-	2-	3	2+	1
23	1-	2	2	2	2-	1+	1	1+	0+	2-	2+	2-	2-	1+	1	1+
24	2-	2-	1-	0+	0+	1	3-	1+	2-	2-	1	0+	0+	1	3-	1+
25	1+	1	1	3	3	3-	2+	1	1+	1	1	3	3+	3-	2+	1-
26	2-	2-	2-	2-	3+	4	5-	4	1+	2-	1+	1+	3+	4-	5-	4
27	3+	3+	4+	5-	3+	2+	1+	3-	3+	3+	4+	5-	3+	2+	1+	2+
28	2+	3	4-	2+	2+	3-	2-	3-	2+	3+	4-	3-	2	2+	1+	3-
29	2+	2	1+	3-	4-	5-	4-	3-	2	2-	2-	3-	4-	5-	4-	3-
30	1+	3	3+	4	4	5	4	3+	1+	3	4-	4	4	5-	4	3+
31	3-	2+	2+	3-	4-	4+	3+	3	3	2+	2+	2+	4-	4	3+	3

Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap ≤6 but one Kp ≥3o or two Kp values ≥3-"). An * means "not really disturbed" (Ap<20).

Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

IMP 7 AND 8 ELECTRONS

MAY 1978



83
Misc
May 78

IMP 7 AND 8 LOW ENERGY PROTONS

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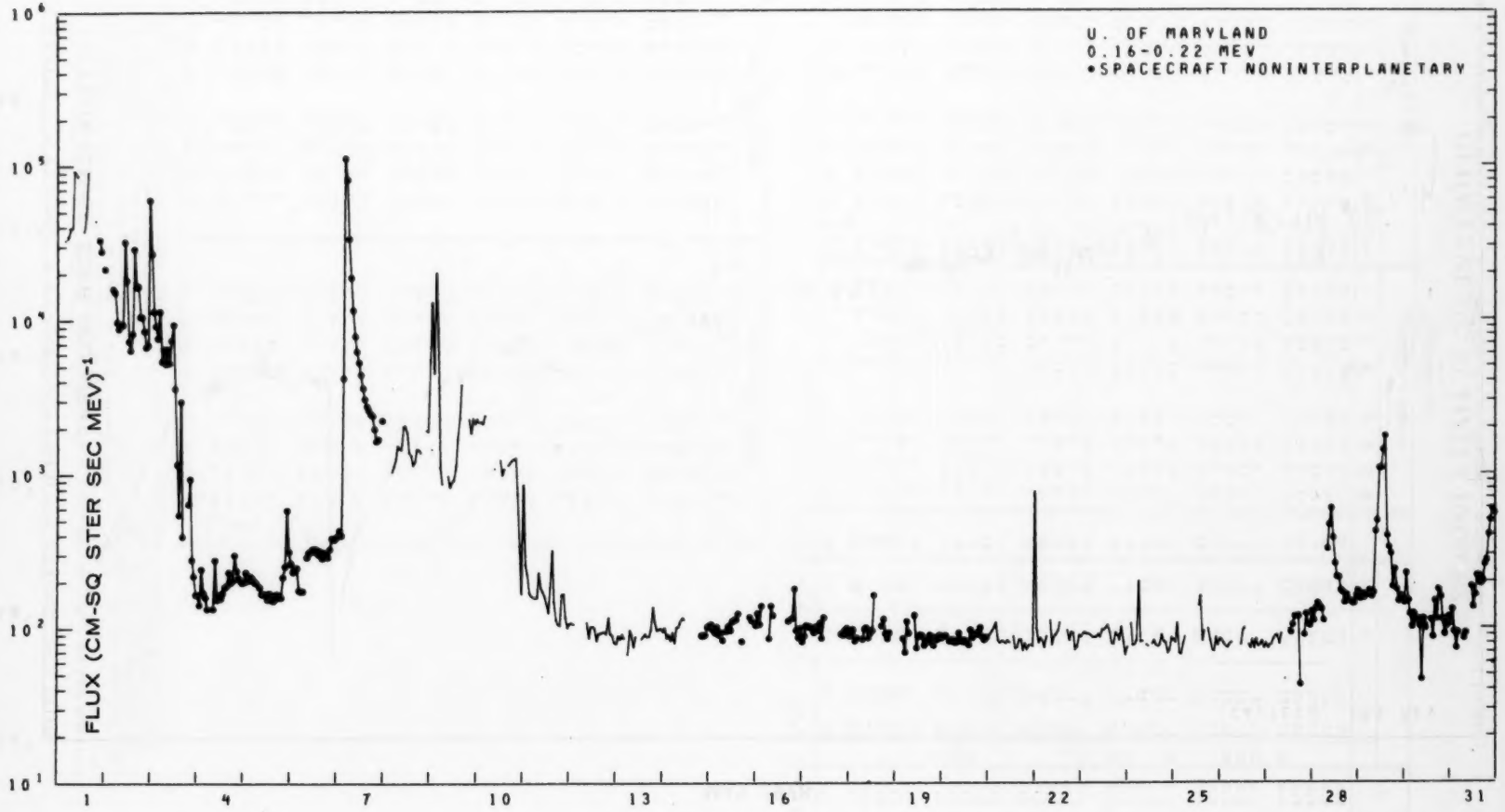
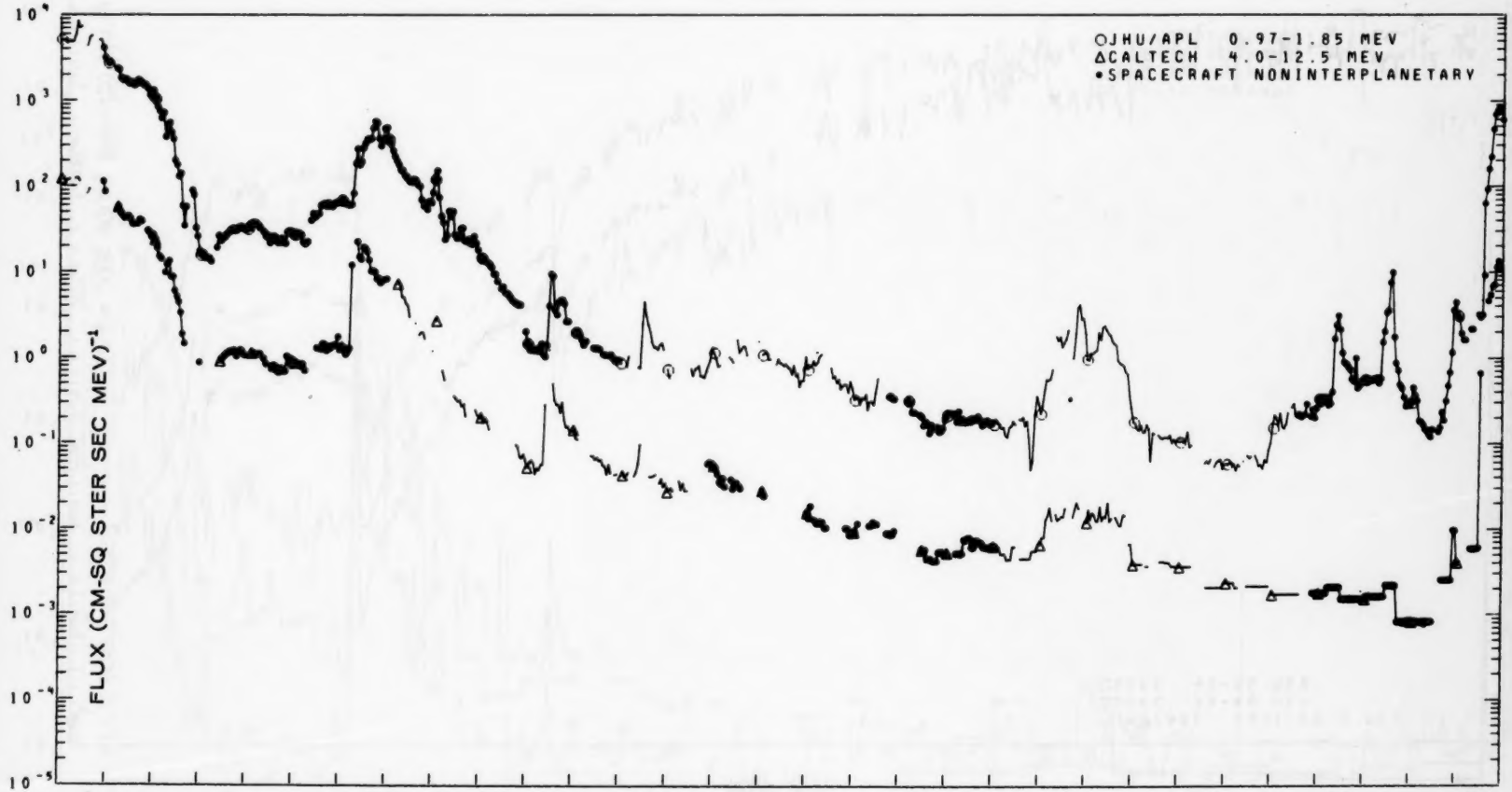


IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

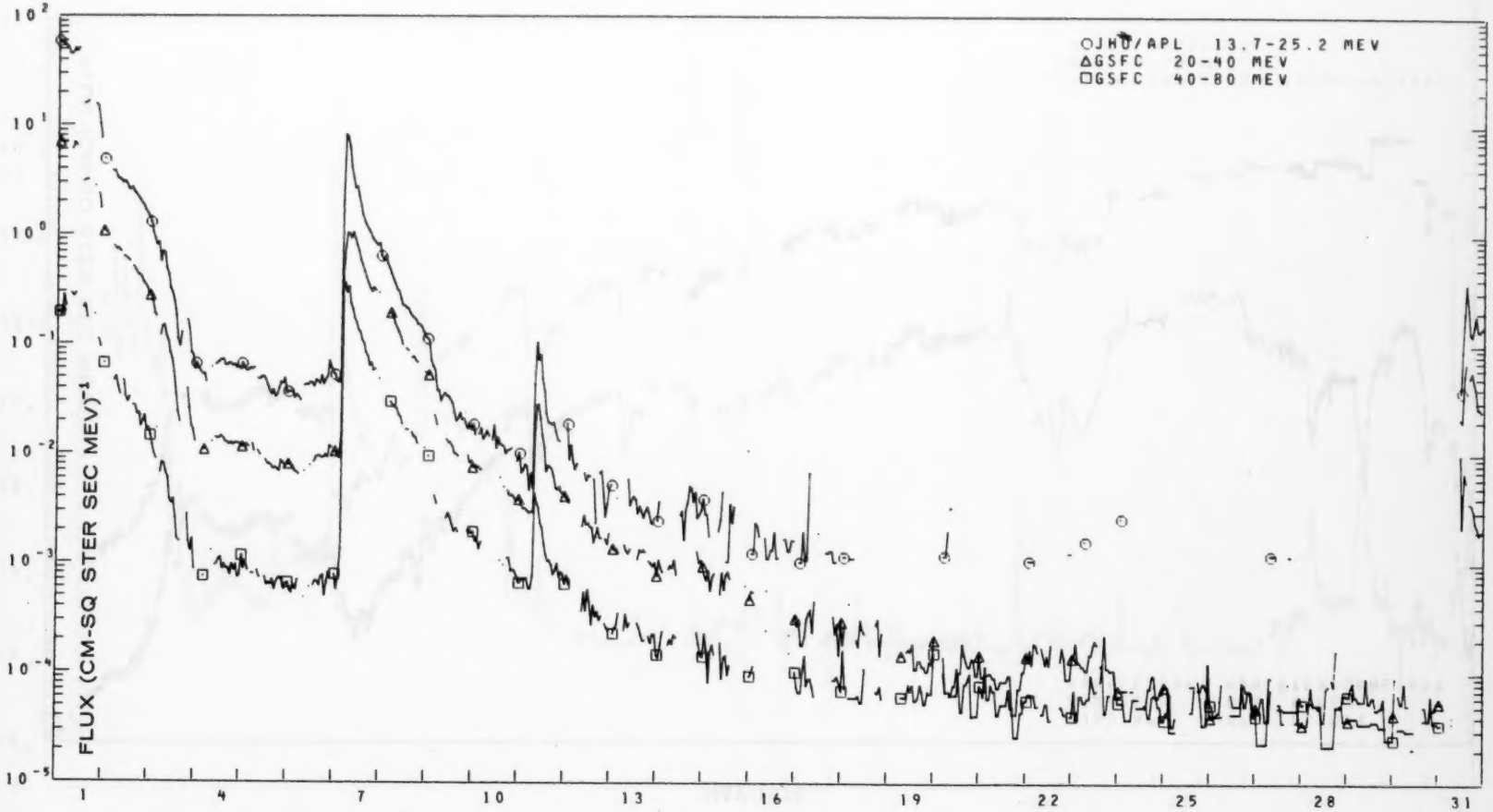
MAY 1978



85
Misc
May 78

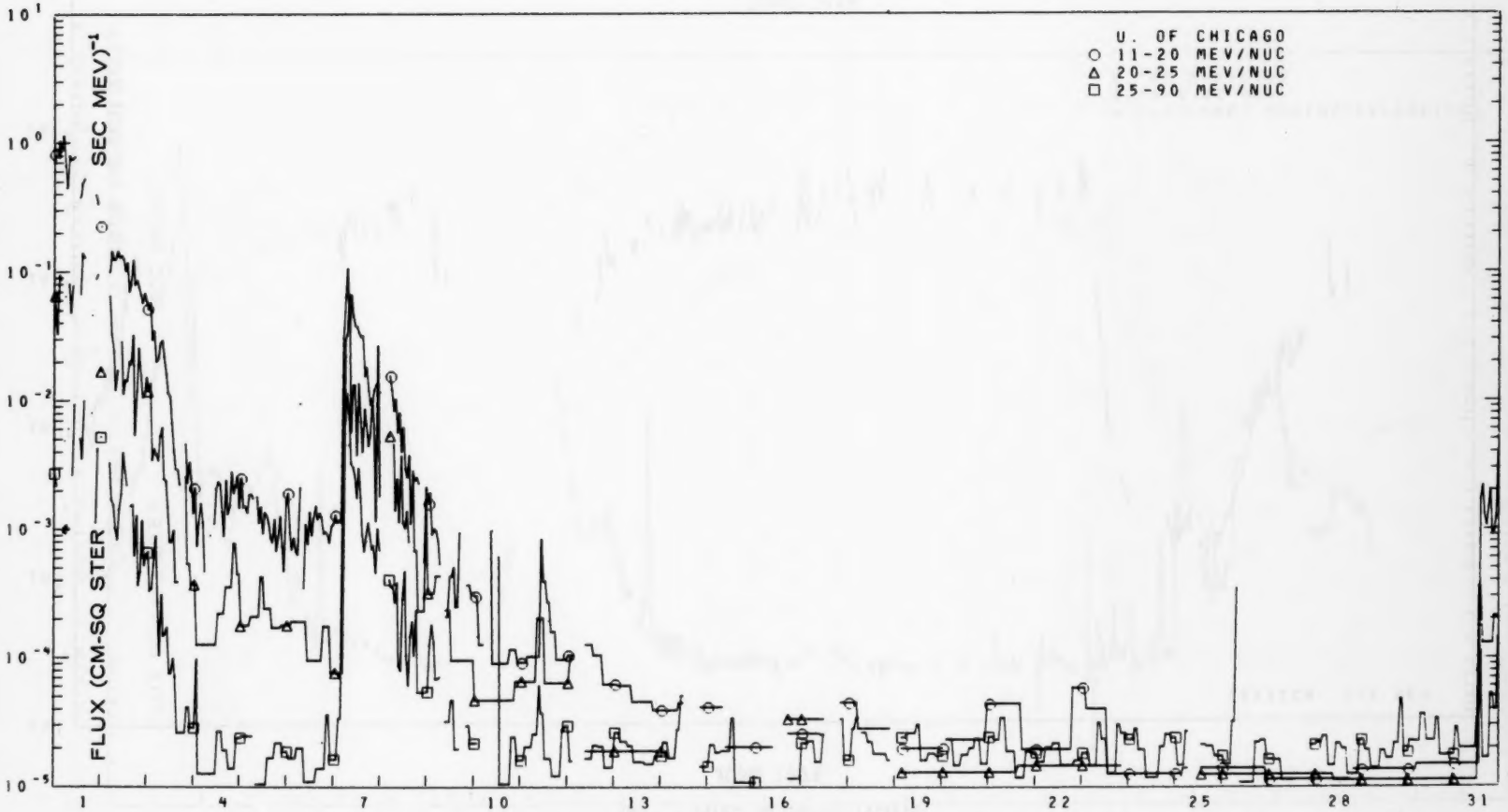
IMP 7 AND 8 HIGH ENERGY PROTONS

MAY 1978



IMP 7 AND 8 ALPHA PARTICLES

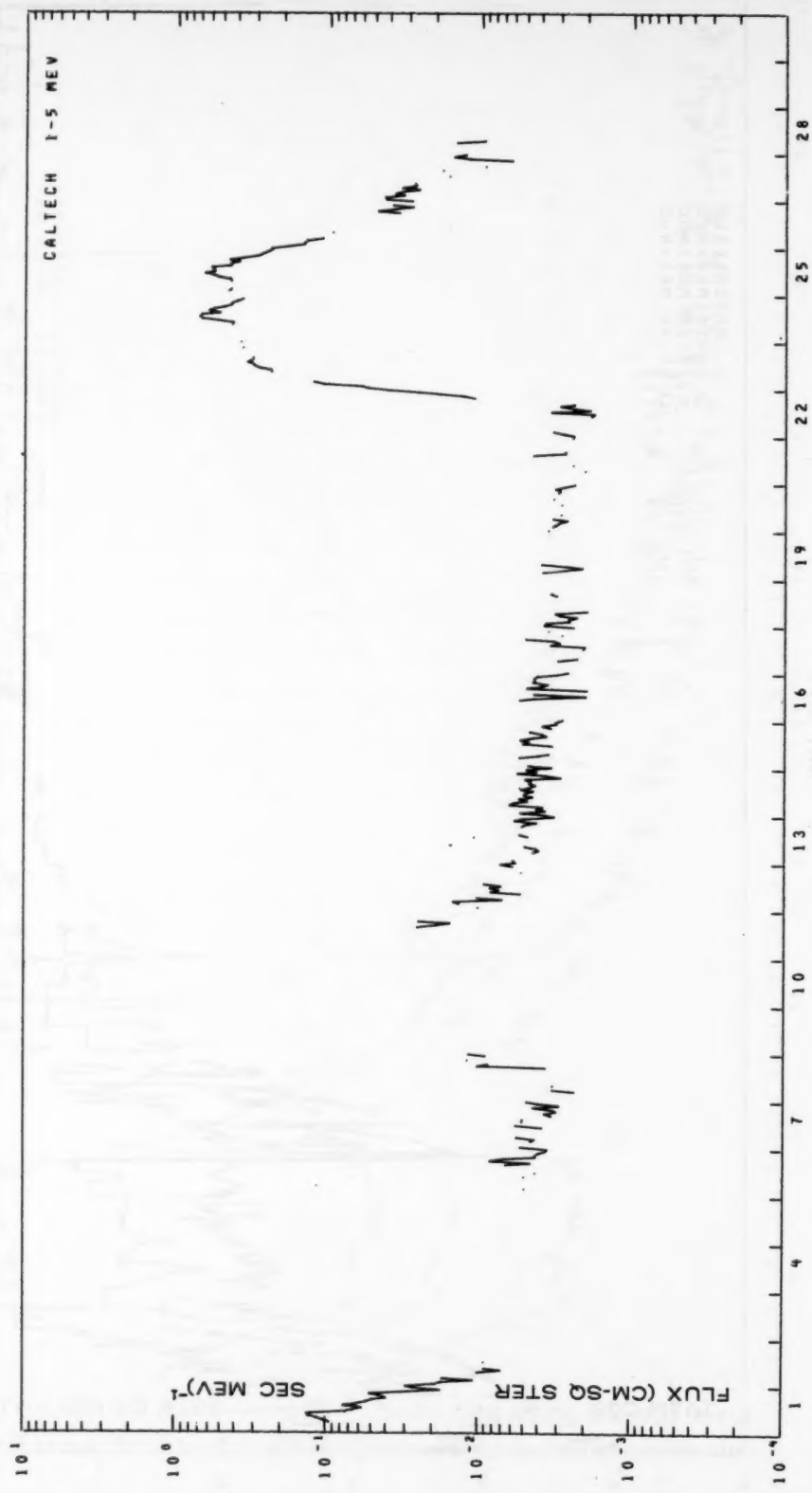
MAY 1978



87
Misc
May 78

IMP 7 AND 8 ELECTRONS

JUNE 1978



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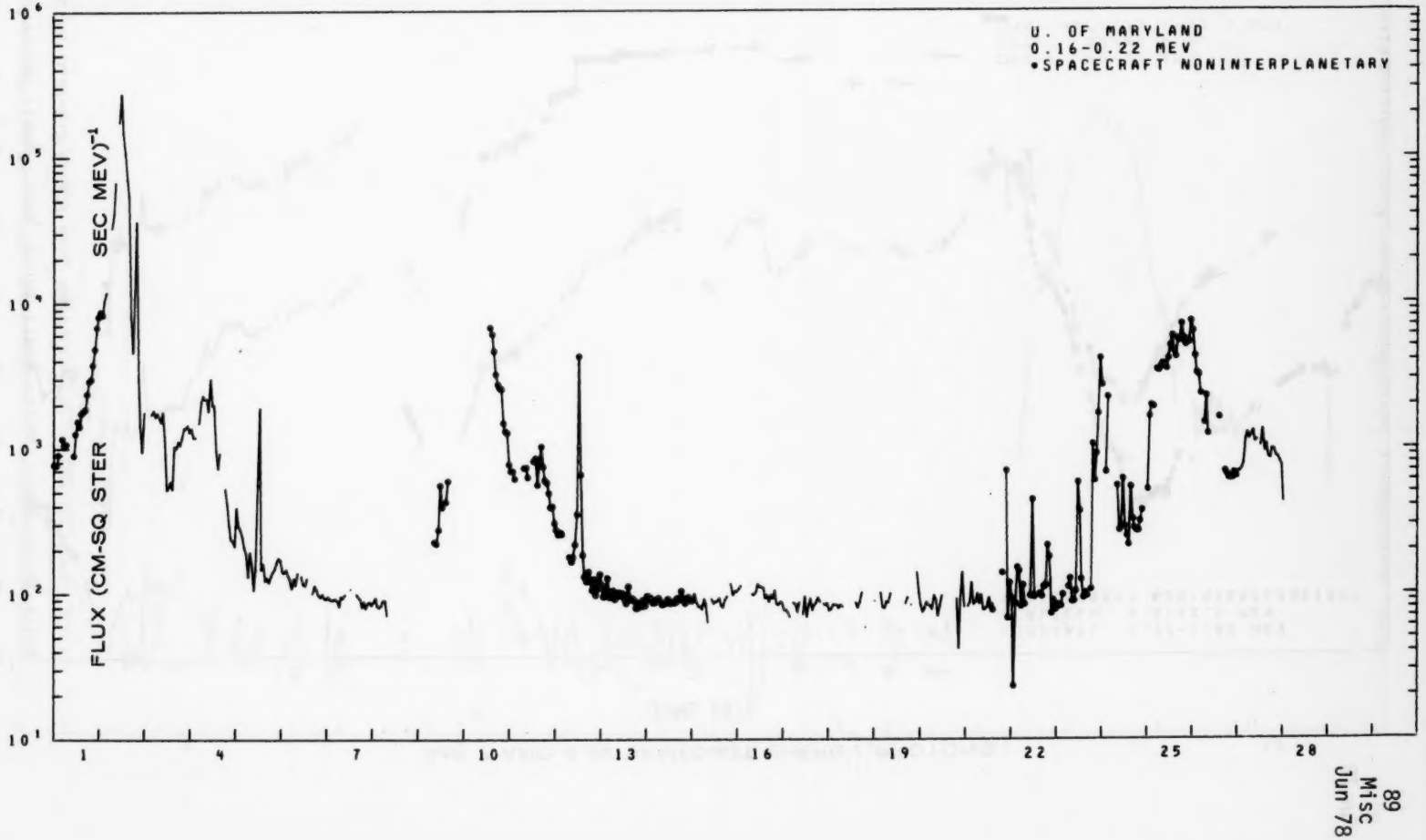
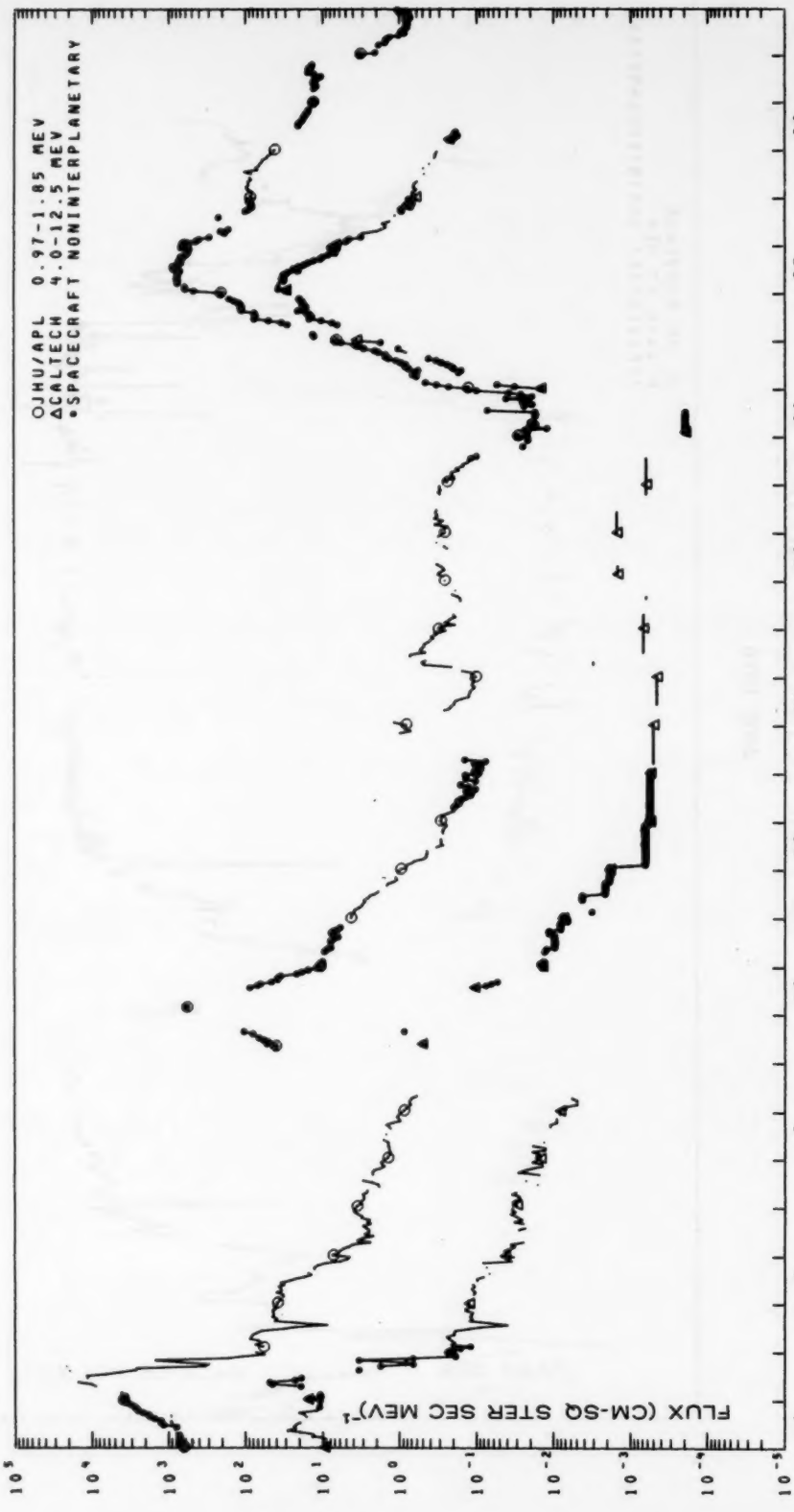
JUNE 1978



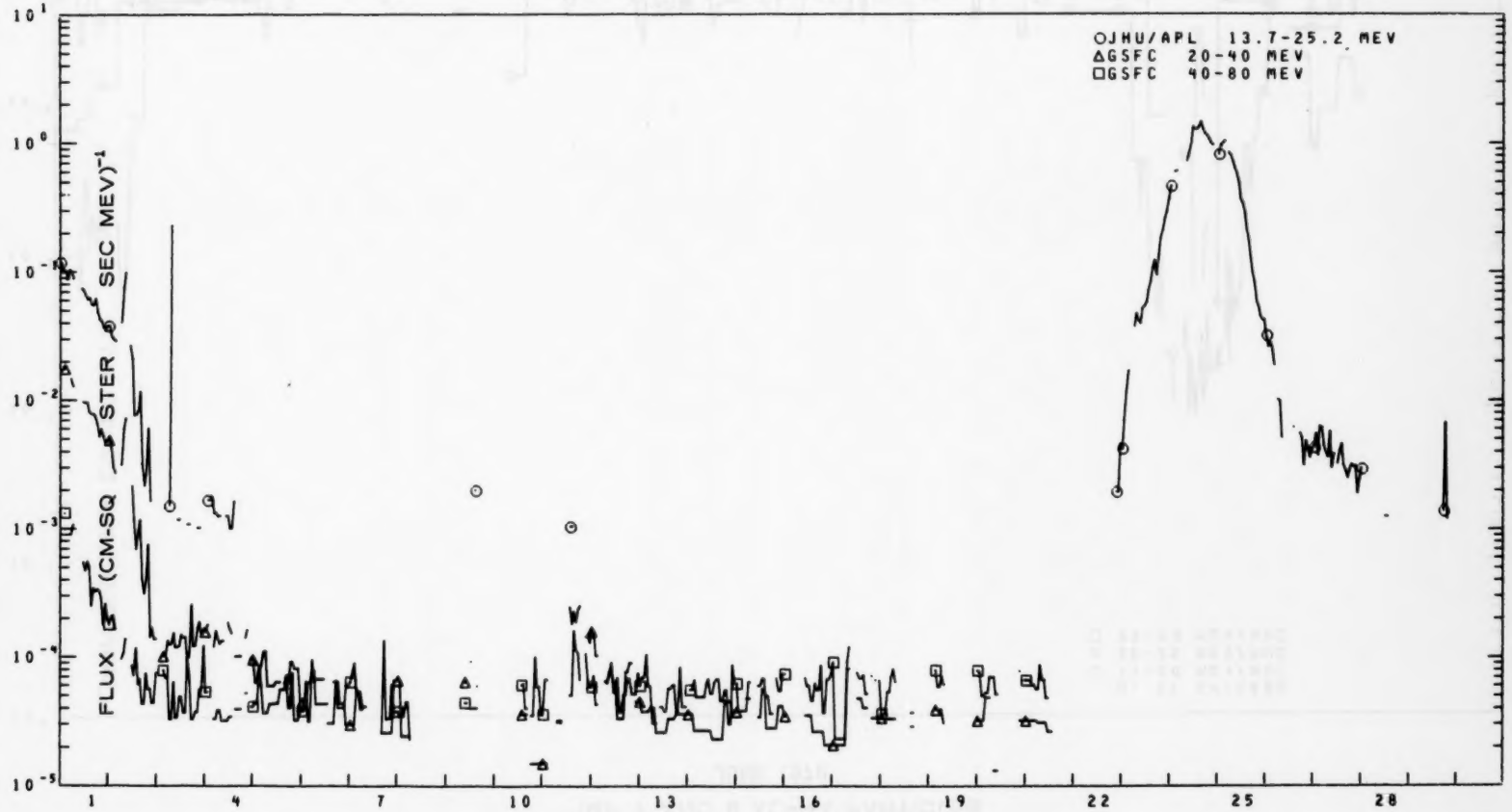
IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

JUNE 1978



IMP 7 AND 8 HIGH ENERGY PROTONS

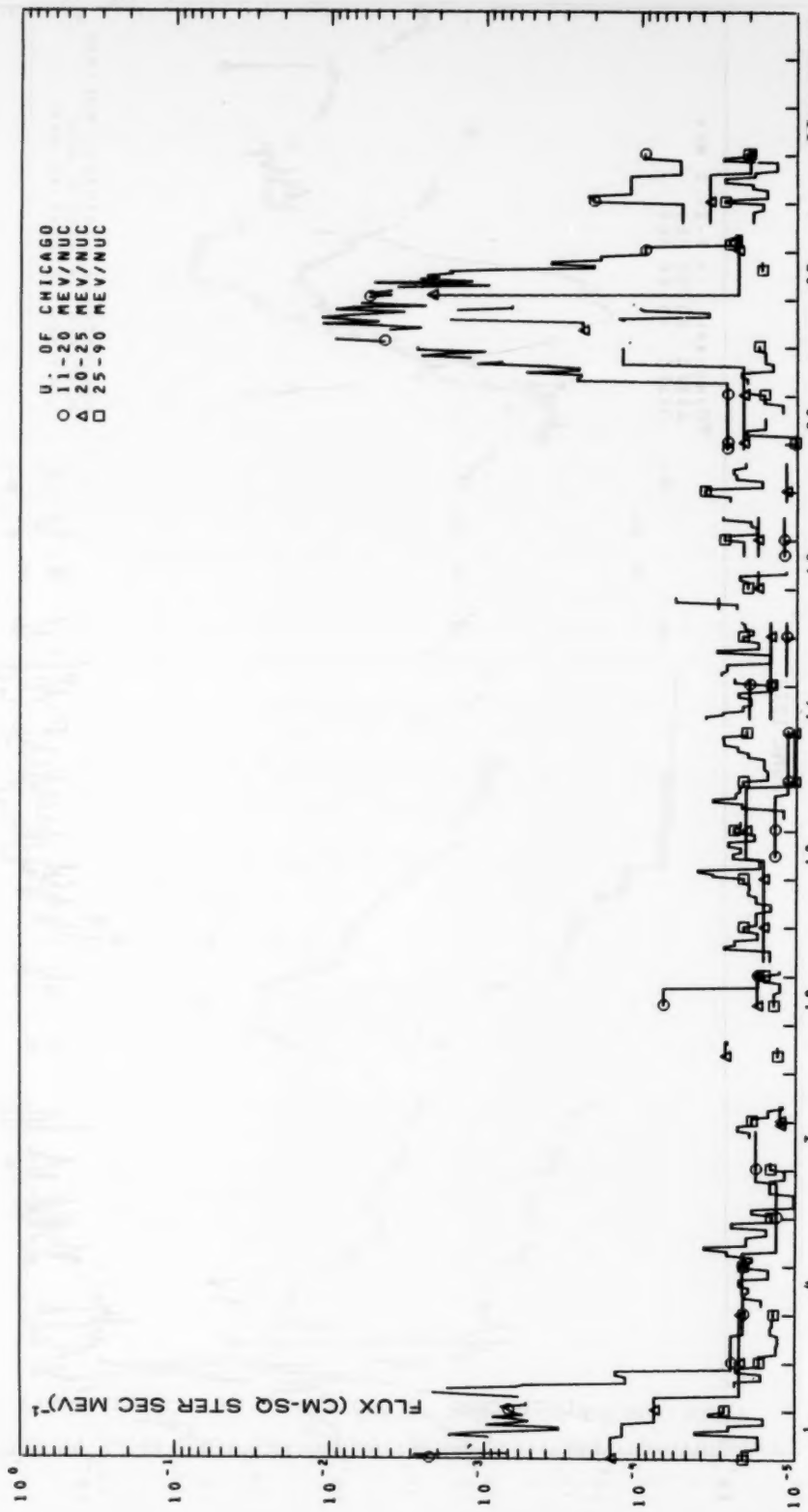
JUNE 1978



91
Misc
Jun 78

IMP 7 AND 8 ALPHA PARTICLES

JUNE 1978



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